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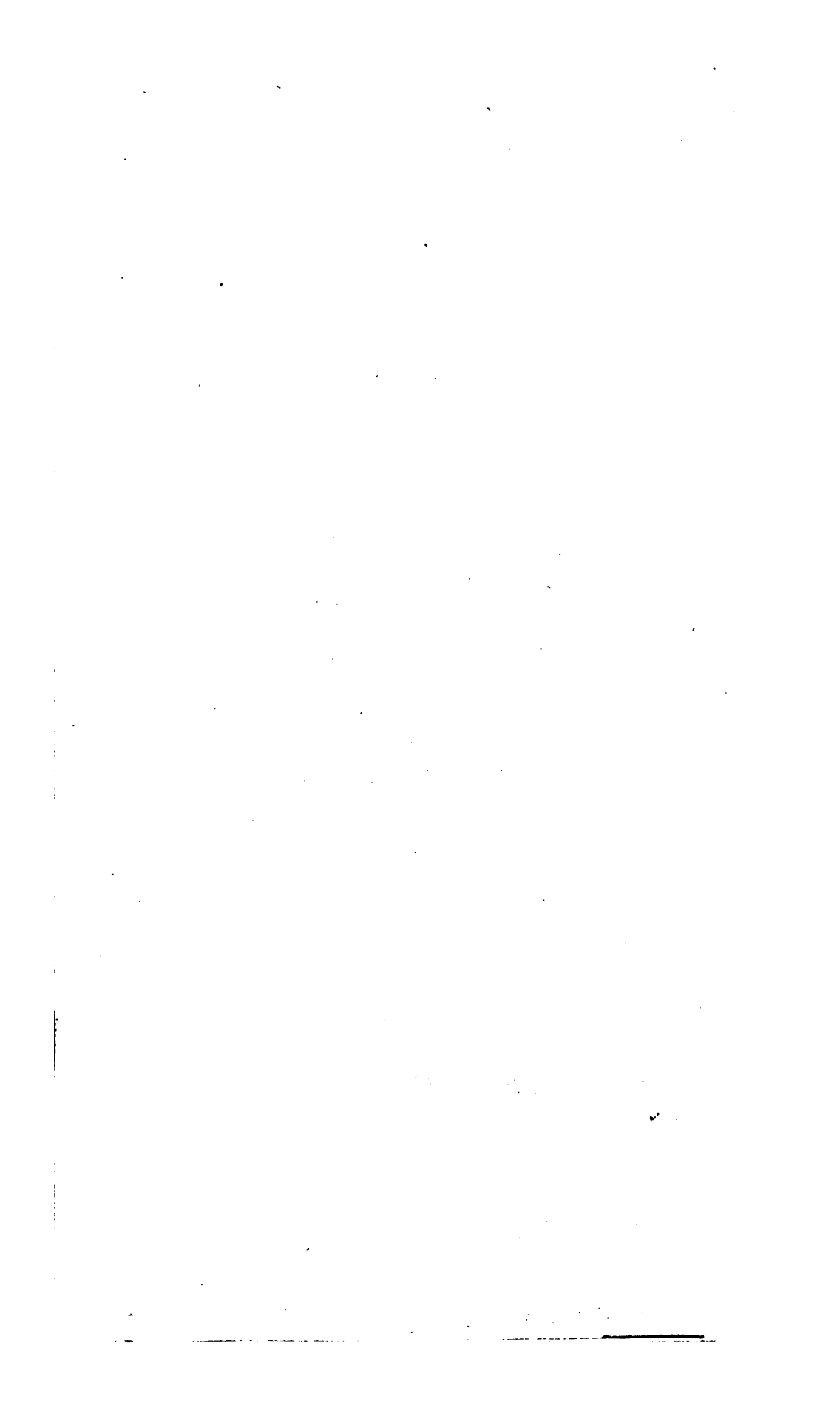
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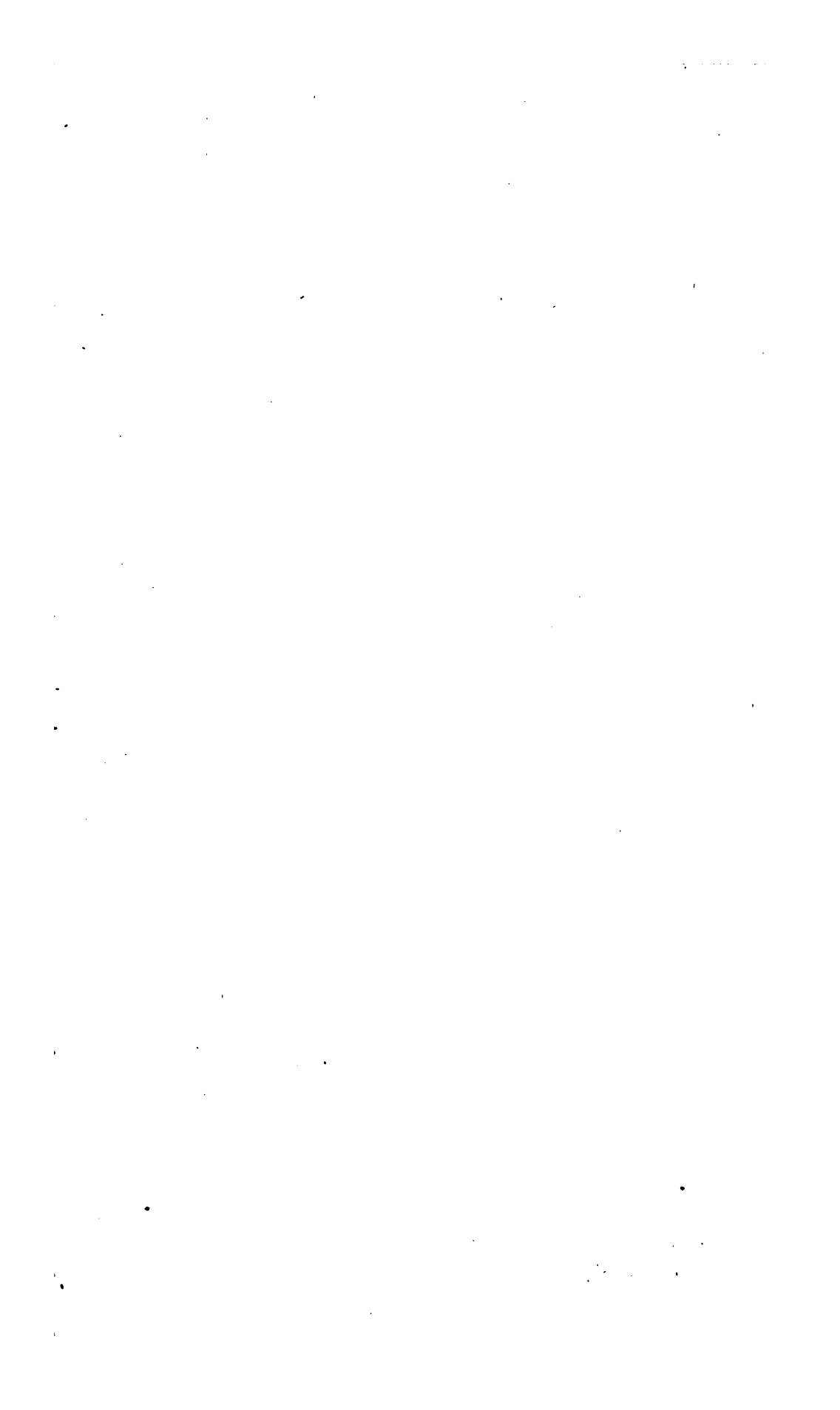
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ARTES SCIENTIA VERITAS







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**K E Y**  
**TO**  
**LEONARD'S ARITHMETIC.**

**FOR TEACHERS ONLY.**

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**By GEORGE LEONARD, JR.**

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**BOSTON;**  
**OTIS, BROADERS, AND COMPANY.**  
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**1842.**



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Key

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## PREFACE.

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THE following Key to Leonard's Arithmetic has been prepared for those teachers, who desire to have a proper method for the solution of each example at hand, at all times, for inspection. The sale of the Arithmetic has become large, and a Key has been repeatedly and urgently called for ; not from any uncommon abstruseness in the subjects and examples, but from a wish to become acquainted with the minutest steps of each process, approved by the Author. Especially in those subjects where much of the matter bears but a distant resemblance to that found in other books on similar topics. The Mechanical Powers, Specific Gravity, Gauging, Insurance, General Average, Discount, Equation of Payments, Mensuration, &c., are articles of this kind. Indeed, a considerable part of the Arithmetic differs materially from any other ; for the subjects which relate to business, are adapted to business as it is now done, and a large portion of the examples are such as really occur in actual life. Whereas, in other arithmetics the examples, as well as the rules, are nearly all compiled from old books ; so that a person who has studied one, has, in a measure, studied all, since they are all derived from the same sources. Who can possibly derive any idea of the operations required in practical affairs, at the present time, from the study of such antiquated rules and questions ; many of which were imaginary in their origin ?

A Key is doubtless more requisite for this book than for others, in which the teacher has merely to pursue the old beaten road. It is not pretended, however, that the manner of

working pursued here is in every case, the best that can be imagined, or gives the result with the smallest number of figures. But I have endeavoured to calculate by good methods ; methods which conform to the rules ; which are fitted for the transaction of business ; which can be understood, and by which the answer is obtained by means of a moderate number of figures. It should be kept in mind, that a course which in one example yields the answer with little labor, may be very tedious when applied to other questions, even if they are similar, and under the same rule. In fact, the trouble of finding such a course may be greater than the labor required in working with a larger number of figures by a more obvious method. Besides, we are liable to mistakes of various kinds, when much of the process is performed in the mind, or when one operation is made to cancel another. Many of the regular steps being then obliterated, the work cannot be fully understood by others, or even by ourselves.

The scholar should not be required to proceed in each sum in the same manner that is pursued here ; it is sufficient if he obtains the true answer by a correct method, though it be more difficult than the one in the Key. Should his course be quite long and tedious, it may then, indeed, be well to require him to seek a more ready method, and perhaps lead him to one by appropriate questions. But in no case should he be told fully and precisely in what manner he should perform an example. Questions that will induce him to think, and lead him, by his own reasoning to short and simple solutions, are proper, but positive directions should rarely be given.

Speaking of the impolicy of telling a scholar every step to be taken, reminds me of the propriety of saying a few words concerning the great number of rules and precepts to be found in many arithmetics. In these books every subject contains at least one rule, although the examples may involve the same principles as those under a general rule, by which they may be solved.

Now what does a scholar learn when there is such a multitude of rules. He merely learns to decipher the meaning of each one, and to take every step required by it in working the examples which

follow ; nothing more. When there is a rule for every thing, the reasoning faculties of the learner, so far as any useful exercise is concerned, are left at rest ; the author thinks for him, and really solves the examples for him ; he has nothing to do but go through the operations pointed out in the rules.

The scholar cannot remember these rules for any length of time. He cannot carry his arithmetic about in his pocket, to consult, in every question that arises in business. He is not exercised in applying common sense to discover the arithmetical operations proper to employ in each case. In fact, he is not taught to refer all ordinary calculations to a few simple, easily remembered principles ; the only course which can be of use to him in after life.

Persons who have pursued arithmetic in this way, hardly ever attempt to work in practice as they have been taught. They forget most of the immense mass of rules in a few months after leaving school ; and the questions that occur in business, they solve by common sense ; as well as a lack of all previous exercise in such a course will admit.

Another error, quite opposite the one I am now censuring, consists in dispensing with rules almost entirely. This course is not so injurious to the mind as the other ; but it is very tedious to refer back to first principles in all cases. The teacher, who has constant exercise, may be able to do so with sufficient facility. The apt scholar may also be ready enough while he is constantly engaged in this study, but in practical life he soon loses this facility, and forgets the half-perceived principles which have influenced him in many calculations. Indefinite ideas, or ideas that we have not learned to express or generalize in a sentence, soon pass from the mind.

From the preceding considerations it is obvious, that there should be but a moderate number of general rules ; the truth and propriety of which the scholar can be readily taught to understand and appreciate. These few rules can be remembered, and they serve as resting points to the mind. A person, by investigating each example in his book, and discovering the principles involved,

and the rules which apply, soon acquires an aptitude in this exercise ; with an acuteness of perception that will enable him to overcome any difficulty that may arise in the many novel cases that constantly occur.

Another point in the Arithmetic connected with the Key, is worthy of discussion. Some teachers are anxious, that the answers should appear in the Key only, and should not be given in the Arithmetic, while a great majority prefer to have them constantly before the learner. There are, undoubtedly, both advantages and disadvantages in having the answers given. The greatest and almost only objection to answers in the Arithmetic, arises from the student's abuse of the information. In Addition, Subtraction, Division, Decimal Fractions, and in a few questions in some other subjects, the scholar can employ the answer to relieve him of much of his labor, unless he is counteracted. This difficulty can be obviated, in these rules, by having many examples worked on the black-board during recitation. Also, by occasionally requiring the class to close their books, and giving out questions to be solved on the slates. The last course excites each scholar's emulation to exceed his fellows in correctness and despatch. It should frequently be resorted to on this account alone.

In most of the rules the answers furnish no hint of the method of solution, and are rather beneficial than injurious, especially when extensive use is made of the black-board.

In conclusion, it may be well to observe, that this Key, being intended for teachers only, is published in a peculiar manner, in order to keep it out of the scholar's hands. It can be obtained only by a teacher, who applies personally to the publishers, or who sends them a *written* order by some bookseller or other person with whom they are acquainted.

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## ADDITION.

### Lesson 13.

(2)	(3)	(4)	(5)
100	3	23	30112
201	2	12	23010
322	3	113	14234
1265	1		2322
<hr/>	<hr/>	<hr/>	<hr/>
Ans. 1,888	Ans. 9	Ans. 148	Ans. 69,678 dollars.

### Lesson 14.

(2)	(3)	(4)	(5)
8	37276	975	75
9	9536	483	57
15	45092	237	88
7	8870	87	10
<hr/>	<hr/>	<hr/>	<hr/>
Ans. 39	Ans. 100,774	Ans. 2,471 dollars.	Ans. 230 dollars.

### Lesson 15.

(1)	(2)	(3)
456321783	576377	88745
283683001	6892203	3431
477054212	7203578	48032
336864326	4349	23324
<hr/>	<hr/>	<hr/>
Ans. 1,553,923,322	Ans. 15,319,988	Ans. 237,314

### Lesson 16.

(1)	(2)	(3)	(4)
858	230007321	5	1000
375	562077899	37	5675
9	125766232	463	8340
4507	440488552	5398	12345
23	234711143	93424	<hr/>
1	<hr/>	643779	Ans. 27,360 dol-
456	Ans. 1,593,051,147	29944	[lars.
678		<hr/>	
<hr/>		Ans. 773,050	
Ans. 6,907			



## ADDITION.

(5)	(7)	(8)	(9)
45	34	3575412	15255
18	28	900	9237
156	27	8	12676
225	32	27	2'75
9	42	8208	
	29	450275	Ans. 37,443
Ans. 453	33	633	[dollars.
	35	44	
(6)	30	65000	(10)
1706		1225	165200
84	Ans. 290 bushels.		47695
		Ans. 4,101,732	8279
Ans. in 1790			3545
			Ans. 224,719
			[bushels.

## Lesson 17.

(1)	(2)	(3)	(4)	(5)
135	27	399462	85	2327
75	21	269533	37	637
27	—	280679	6	
96	Ans. 48 years.	610014	5	Ans. 2,964 dollars.
65		97210	275	
		297211		
Ans. 398 dollars.		Ans. 1,954,109	Ans. 408 dollars.	
(6)	(7)	(8)		
25	7	6236		
58	87455383	614		
12	67914533	869		
75	29	325		
	456			
Ans. 170 cents.	500000	Ans. 8,044 dollars.		
	Ans. 155,870,408			

(9)	(10)
2756	115
1000	42
75	186
467	145
395	16
5832	24
Ans. 10,525 dollars.	Ans. 528 miles.

## SUBTRACTION.

## Lesson 23.

(2)	(3)	(4)	(5)	(6)
96	688	45647	8946	1507
45	133	21546	805	1103
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Ans. 51	Ans. 555	Ans. 24,101 feet.	Ans. 8,141 dollars.	Ans. 404 [bushels.]

## Lesson 24.

(2)	(3)	(4)	(5)
<del>636</del>	35	8005	112305
457	9	5126	81307
<hr/>	<hr/>	<hr/>	<hr/>
Ans. 179	Ans. 26	Ans. 2,879 dollars.	Ans. 30,998 dollars.

## Lesson 25.

(2)	(3)	(4)	(5)
60025	324573819746	510002	174833
46	147233518869	120005	52003
<hr/>	<hr/>	<hr/>	<hr/>
Ans. 59,979	Ans. 177,340,300,877	Ans. 389,997	122,830 Ans.]

## Lesson 26.

(1)	(2)	(3)
64321535488327	9000052	750081
10035780321199	1643215	3011
<hr/>	<hr/>	<hr/>
Ans. 54,285,755,167,128	Ans. 7,356,837	Ans. 747,070

(4)	(5)	(6)	(7)
81	1799	11375	48323
33	67	3287	19295
<hr/>	<hr/>	<hr/>	<hr/>
Ans. 48	Ans. in 1732	Ans. 8,088 dollars.	Ans. 29,028 dollars.

(8)	(9)	(10)
43000	275	23
25376	125	16
<hr/>	<hr/>	<hr/>
Ans. 17,624	Ans. 150 bushels; cost 202 dollars.	39
		23
		39
		23
		<hr/>
		Ans. 16

## MULTIPLICATION.

## Lesson 27.

(1)	(2)	(3)	(5)
1210	75	103	2750
3145	39	27	1385
<u>4355</u>	<u>5635</u>	<u>4135</u>	<u>275</u>
	4355	598	598
Ans. 1,280	Ans. 36 feet.	Ans. 76 dollars.	

Ans. 3,537 dollars.

(6)	(7)	(8)
32052465	2332	15235
22297621	1421	12250
<u>Ans. 9,754,844</u>	<u>Ans. 911 miles.</u>	<u>Ans. 2,985 dollars.</u>
(9)	(10)	
235	2000	
147	9	
<u>Ans. 88 dollars.</u>	<u>Ans. 1,991 bushels.</u>	

## MULTIPLICATION.

## Lesson 33.

(2)	(3)	(4)	(5)
15	196	5280	185000000
2	9	3	4
<u>Ans. 30</u>	<u>Ans. 1,764 pounds.</u>	<u>15840</u>	<u>Ans. 740,000,000</u>
		6	
		<u>Ans. 95,040</u>	

## Lesson 34.

(2)	(3)	(4)	(5)
134	2327	345	1235
25	14	94	112
<u>670</u>	<u>9308</u>	<u>1380</u>	<u>2470</u>
268	2327	3105	1235
<u>Ans. 3,350</u>	<u>Ans. 3,2578</u>	<u>Ans. 3,2430</u>	<u>1235</u>
[dollars.]	[dollars.]		Ans. 138,320 dollars.

**Lesson 35.**

(2)	(3)	(4)
6357	4821	43002
2335	1131	25
-----	-----	-----
31785	4821	215010
19071	14463	86004
19071	4821	-----
12714	4821	Ans. 1,075,050
-----	-----	
• Ans. 14,843,595	Ans. 5,452,551	

**Lesson 36.**

(1)	(2)	(3)
254420335	815555	5001
3347889	5542	357
-----	-----	-----
2289783015	1631110	35007
2035362680	3262220	25005
2035362680	4077775	15003
1780942345	4077775	-----
1017681340	-----	Ans. 1,785,357
763261005	Ans. 4,519,805,810	
763261005		
-----		
Ans. 861,771,040,922,815		

(4)	(5)	(6)	(7)
234	5237	421	646325
19	8	42	5335
-----	-----	-----	-----
2106	Ans. 41,896 dollars.	842	3231625
234		1684	1938975
-----		-----	1938975
Ans. 4,446 dollars.		Ans. 17,682	3231625
			-----
			Ans. 3,448,143,875

(8)	(9)	(10)
35	25	832
5	12	13
-----	-----	-----
Ans. 175 dollars.	50	2496
	25	832
	-----	-----
	Ans. 300 dollars.	Ans. 10,816

## MULTIPLICATION.

## Lesson 37.

(1) 12212 375 <hr/> 61060 85484 36636 <hr/> Ans. 4,579,500	(2) 313 225 <hr/> 1565 626 626 <hr/> Ans. 70,425 days.	(3) 8231 26 <hr/> 49386 16462 <hr/> Ans. 214,006 dollars.
(4) 473 116 <hr/> 2838 473 473 <hr/> Ans. 54,868 dollars.	(5) 303 12 <hr/> 606 303 <hr/> Ans. 3,636 dollars.	(6) 351 41 <hr/> 351 1404 <hr/> Ans. 14,391 times.
(7) 18 9 <hr/> Ans. 162 dollars.	(8) 15 12 <hr/> 30 15 <hr/> Ans. 180 miles.	(9) 459 3 <hr/> Ans. 1,377 dollars.
		(10) 189 13 <hr/> 567 189 <hr/> Ans. 2,457 dollars.

## Lesson 38.

(2) 35 4 <hr/> 140 3 <hr/> 420 52 <hr/> 840 2100 <hr/> Ans. 21,840 dollars.	(3) 236 11 <hr/> 236 236 2596 27 <hr/> 18172 5192 70092 19 <hr/> 630828 70092 1331748 7 <hr/> Ans. 9,322,236	(4) 5321 424 <hr/> 21284 10642 21284 <hr/> 2256104 33 <hr/> 6768312 6768312 <hr/> Ans. 74,451,432
--	---	---

$$\begin{array}{r} (5) \\ 12 \\ 10 \\ \hline 120 \\ 3 \\ \hline \end{array}$$

Ans. 360 bushels.

$$\begin{array}{r} (6) \\ 24 \\ 9 \\ \hline 216 \\ 7 \\ \hline \end{array}$$

Ans. 1,512 miles.

$$\begin{array}{r} (7) \\ 25 \\ 9 \\ \hline 225 \\ 8 \\ \hline 1800 \\ 7 \\ \hline 12600 \\ 6 \\ \hline 75600 \\ 5 \\ \hline \end{array}$$

Ans. 378,000

**Lesson 39.**

$$\begin{array}{r} (2) \\ 245181 \\ 6005 \\ \hline 1225905 \\ 1471086 \\ \hline \end{array}$$

Ans. 1,472,311,905

$$\begin{array}{r} (3) \\ 1296 \\ 206 \\ \hline 7776 \\ 2592 \\ \hline \end{array}$$

Ans. 266,976

$$\begin{array}{r} (4) \\ 3837 \\ 2108 \\ \hline 30696 \\ 3837 \\ \hline 7674 \\ \hline \end{array}$$

Ans. 8,088,396

$$\begin{array}{r} (5) \\ \text{Ans. 250 dollars.} \end{array}$$

$$\begin{array}{r} (6) \\ \text{Ans. 400 dollars.} \end{array}$$

$$\begin{array}{r} (7) \\ \text{Ans. 165,000 dollars.} \end{array}$$

$$\begin{array}{r} (8) \\ \text{Ans. 45,000} \end{array}$$

$$\begin{array}{r} (9) \\ \text{Ans. 300} \end{array}$$

$$\begin{array}{r} (10) \\ \text{Ans. 255,000} \end{array}$$

**Lesson 40.**

$$\begin{array}{r} (4) \\ 65 \\ 200 \\ \hline \end{array}$$

Ans. 13,000 pounds.

$$\begin{array}{r} (5) \\ 432000 \\ 2100 \\ \hline 432 \\ 864 \\ \hline \end{array}$$

$$\begin{array}{r} (6) \\ 160 \\ 20 \\ \hline \end{array}$$

Ans. 3,200 dollars.

$$\text{Ans. 907,200,000}$$

$$\begin{array}{r} (7) \\ 2000 \\ 6 \\ \hline \end{array}$$

$$\begin{array}{r} (8) \\ 250 \\ 80 \\ \hline \end{array}$$

$$\begin{array}{r} (9) \\ 83500 \\ 977 \\ \hline \end{array}$$

$$\begin{array}{r} (10) \\ 20 \\ 9 \\ \hline \end{array}$$

$$\begin{array}{r} 12,000 \text{ dol-} \\ \text{[lars.} \end{array}$$

$$\text{Ans. 20,000 dol-} \\ \text{[lars.}$$

$$\begin{array}{r} 5845 \\ 5845 \\ 7515 \\ \hline \end{array}$$

$$\text{Ans. 180 dol-} \\ \text{[lars.}$$

$$\text{Ans. 81,579,500}$$

## DIVISION.

## Lesson 46.

(2) 3)126 Ans. 42	(3) 2)264 Ans. 132 dollars.	(4) 5)1230 Ans. 246 dollars.	(5) 8)688 Ans. 86 dollars.
(6) 9)64459 — 1 dollar over. Ans. 7,162 barrels.	(7) 4)216 Ans. 54	(8) 6)1305 — 3 over. Ans. 217 in a flock.	

## Lesson 47.

(2) 12)108(9 cents Ans. 108	(3) 25)1043(41 times Ans. 100 43 25 18 over.	(4) 26)1638(63 months Ans. 156 78 78
(5) 112)1344(12 dollars Ans. 112 224 224	(6) 73)6205(85 Ans. 584 365 365	
(7) 87)35757(411 pounds Ans. 348 95 87 87 87	(8) 34)412(12 to each Ans. 34 72 68 4 over.	

**Lesson 48.**

(2)	(3)	(4)	
1021)457408(448	21)10985(523	32)3584(112	
4084 [Ans.	105 [Ans.	32 [Ans.	
<hr/>	<hr/>	<hr/>	
4900	48	38	(5)
4084	42	32	8)895 — 7 over.
<hr/>	<hr/>	<hr/>	
8168	65	64	Ans. 111
8168	61	64	
	<hr/>		
	4 over.		

**Lesson 49.**

(1)	(2)
7)3647819	3975)46200981(11,622 Ans.
<hr/>	3975
Ans. 521,117	<hr/>
	6450
(3)	3975
1894)115692192(61,083 Ans.	<hr/>
11364	24759
<hr/>	23850
2052	<hr/>
1894	9098
<hr/>	7950
15819	<hr/>
15152	11481
<hr/>	7950
6672	<hr/>
5682	3,531 over.
<hr/>	
990 over.	

(4)	(5)	(6)
6)22302	365)96666(264 dollars a day	17)136(8 Ans.
<hr/>	730 [Ans.	136
Ans. 3,717 dollars.	<hr/>	
	2366	(7)
	2190	6)750
	<hr/>	<hr/>
	1766	Ans. 125 dollars.
	1460	
	<hr/>	
	306 over.	



$$\begin{array}{r} \textcircled{8} \\ 75 \overline{) 975} \text{ (13 Ans.} \\ \underline{75} \\ 225 \\ \underline{225} \end{array}$$

$$\begin{array}{r} \textcircled{9} \\ 45 \overline{) 5310} \text{ (118 Ans.} \\ \underline{45} \\ 81 \\ \underline{45} \\ 360 \\ \underline{360} \end{array}$$

$$\begin{array}{r} \textcircled{10} \\ 434 \overline{) 3472} \text{ (8 Ans.} \\ \underline{3472} \end{array}$$

**Lesson 50.**

$$\begin{array}{r} \textcircled{1} \\ 25 \overline{) 28400} \text{ (1,136 dollars} \\ \underline{25} \quad \text{[Ans.} \\ 34 \\ \underline{25} \\ 90 \\ \underline{75} \\ 150 \\ \underline{150} \end{array}$$

$$\begin{array}{r} \textcircled{2} \\ 4 \overline{) 108} \\ \underline{4} \\ \text{Ans. 27} \\ \textcircled{4} \\ 25 \overline{) 625} \text{ (25 pounds Ans.} \\ \underline{50} \\ 125 \\ \underline{125} \end{array}$$

$$\begin{array}{r} \textcircled{3} \\ 44 \overline{) 528} \text{ (12 cents Ans.} \\ \underline{44} \\ 88 \\ \underline{88} \\ \textcircled{5} \\ 15 \overline{) 225} \text{ (15 Ans.} \\ \underline{15} \\ 75 \\ \underline{75} \end{array}$$

$$\begin{array}{r} \textcircled{6} \\ 37 \overline{) 57202} \text{ (1,546 days} \\ \underline{37} \quad \text{[Ans.} \\ 202 \\ \underline{185} \\ 170 \\ \underline{148} \\ 222 \\ \underline{222} \end{array}$$

$$\begin{array}{r} \textcircled{7} \\ 1333 \overline{) 6665} \text{ (5 Ans.} \\ \underline{6665} \\ \textcircled{8} \\ 7 \overline{) 28791} \\ \underline{7} \\ \text{Ans. 4,113} \end{array}$$

$$\begin{array}{r} \textcircled{9} \\ 360 \overline{) 364920} \text{ (9,123 Ans.} \\ \underline{360} \\ 49 \\ \underline{40} \\ 92 \\ \underline{80} \\ 120 \\ \underline{120} \\ \textcircled{10} \\ 9 \overline{) 873} \\ \underline{81} \\ 63 \\ \underline{63} \\ \text{Ans. 97 miles.} \end{array}$$

**Lesson 51.**

$$\begin{array}{r} \textcircled{3} \\ 7 \overline{) 105} \\ \underline{7} \\ \text{Ans. 15} \end{array}$$

$$\begin{array}{r} \textcircled{4} \\ 65 \overline{) 1625} \text{ (25 Ans.} \\ \underline{130} \\ 325 \\ \underline{325} \end{array}$$

$$\begin{array}{r} \textcircled{5} \\ 7 \overline{) 168} \text{ (24 Ans.} \\ \underline{4} \\ 28 \\ \underline{21} \\ 7 \\ \underline{7} \\ 0 \\ \text{Ans. 24} \\ \textcircled{5} \\ 168 \overline{) 4872} \text{ (29 pounds Ans.} \\ \underline{336} \\ 1512 \\ \underline{1512} \end{array}$$

$$\begin{array}{r} 84 \\ \underline{84} \\ 0 \\ \text{2 horses.} \\ \underline{168} \end{array}$$

<p>(6)</p> $\begin{array}{r} 13 \\ 8 \\ \hline 104 \\ 11 \\ \hline 104 \\ 104 \\ \hline 1144 \\ 3 \\ \hline 3432 \end{array}$ <p>17160(5 Ans. 17160</p>	<p>(7)</p> $\begin{array}{r} 95 \\ 16 \\ \hline 570 \\ 95 \\ \hline 1520 \end{array}$ <p>85120(56 pounds Ans. 7600</p> $\begin{array}{r} 9120 \\ 9120 \end{array}$
---	--

**Lesson 52.**

<p>(2)</p> $\begin{array}{r} 23 \overline{)2300} \text{ (100 dollars} \\ 23 \quad \text{[Ans.} \\ \hline 00 \end{array}$	<p>(3)</p> $\begin{array}{r} 41 \overline{)42230} \text{ (1,030 Ans.} \\ 41 \quad \hline 123 \\ 123 \\ \hline 0 \end{array}$	<p>(4)</p> $\begin{array}{r} 17 \overline{)89760} \text{ (5,280 Ans.} \\ 85 \quad \hline 47 \\ 34 \\ \hline 136 \\ 136 \\ \hline 0 \end{array}$
<p>(5)</p> $\begin{array}{r} 27 \overline{)27054} \text{ (1,002 Ans.} \\ 27 \quad \hline 054 \\ 54 \end{array}$		
<p>(7)</p> <p>Ans. 530<math>\overline{)00}</math></p>	<p>(8)</p> <p>Ans. 2<math>\overline{)311}</math> over.</p>	<p>(9)</p> <p>Ans. 5998<math>\overline{)43}</math> over.</p>
<p>(10)</p> <p>Ans. 1522<math>\overline{)0}</math></p>	<p>(11)</p> <p>Ans. 372<math>\overline{)000}</math></p>	<p>(12)</p> <p>Ans. 2<math>\overline{)1300}</math> over.</p>

**Lesson 53.**

<p>(2)</p> $\begin{array}{r} 6 \overline{)00122} \text{ } 00 - 200 \text{ over.} \\ \hline \text{Ans. 20} \end{array}$	<p>(3)</p> $\begin{array}{r} 4 \overline{)0002010} \text{ } 000 - 2000 \text{ over.} \\ \hline \text{Ans. 502} \end{array}$
<p>(4)</p> $\begin{array}{r} 45 \overline{)03150} \text{ } 0 \text{ (70 dollars} \\ 315 \quad \text{[Ans.} \\ \hline 0 \end{array}$	<p>(5)</p> $\begin{array}{r} 3 \overline{)0354} \text{ } 1 \text{ over.} \\ \hline \text{Ans. 118} \end{array}$
	<p>(6)</p> $\begin{array}{r} 9 \overline{)0528} \text{ } 0 - 60 \text{ over.} \\ \hline \text{Ans. 58} \end{array}$

(7)	(8)	(9)	(10)
2 0)72 0	5 00)750 00	31 0)124 0(4 acres	7 0)280 0
—	—	124	—
Ans. 36 dollars.	Ans. 150	[Ans.	Ans. 40 days.

## PROMISCUOUS QUESTIONS

IN

ADDITION, SUBTRACTION, MULTIPLICATION, AND DIVISION.

## Lesson 55.

(2)	(3)	(4)
147)3087(21 dollars	307)3684(12 Ans.	1 6 0
294	307	2 5
—	—	—
147	614	8 0
147	614	3 2
(5)	(6)	4 0 0 0
25 45	4 8 2 9 0 0 1	1 0 0
25 25	3 0 0 1 2 8	2 2 0
— 21	—	—
125 20 20	3 8 6 3 2 0 0 8	1 6 0) 4 3 2 0 (2 7 dol-
50	9 6 5 8 0 0 2	3 2 [lars Ans.
—	4 8 2 9 0 0 1	—
625 420	1 4 4 8 7 0 0 3	1 1 2
625	—	1 1 2
420	Ans. 1,4 4 9,3 1 8,4 1 2,1 2 8	

Ans. 1,045 dollars.

(7)	(8)	(9)	(10)
31 0)496 0(16 Ans.	2 0)274 0	12)144(12 Ans.	271
31	—	12	192
—	Ans. 137	—	—
186		24	Ans. 79
186		24	

## Lesson 56.

(1)	(2)
3 7 5 2 0	1 2 4 0
4 2 8 1	7 5
—	8 3
Ans. 4 1,8 0 1 dollars.	5 4
	3 2 3 0
	1 4 5 2
	—
	1 4 5 2
	Ans. 1,7 7 8 dollars.

<p>(3)  <math display="block">\begin{array}{r} 200 \\ 4 \\ \hline 196 \\ 3 \\ \hline 588 \\ 16 \\ \hline 3528 \\ 588 \\ \hline \end{array}</math></p>	<p>(4)  <math display="block">\begin{array}{r} 11200 \\ 1247 \\ \hline 12447 \end{array}</math></p>	<p>(5)          Ans. 45,350 dollars.</p>
	<p> <math display="block">\begin{array}{r} 14000 \\ 12447 \\ \hline \end{array}</math> </p>	
	<p>Ans. 1,553 dollars.</p>	<p>(6)  <math display="block">\begin{array}{r} 141 \\ 47 \\ \hline \end{array}</math> </p>
		<p>Ans. 188 dollars.</p>
<p>dollars cents.</p>		
<p>Ans. 9,408 cents, or 94 08</p>		
<p>(7)  <math display="block">\begin{array}{r} 500 \\ 17 \\ 121 \\ 98 \\ \hline 736 \end{array}</math></p>	<p>(8)  <math display="block">\begin{array}{r} 2521 \\ 178 \\ \hline \end{array}</math></p>	<p>(9)  <math display="block">\begin{array}{r} 15)345(23 \text{ hours} \\ 30 \\ \hline 45 \\ 45 \\ \hline \end{array}</math></p>
	<p>Ans. 2,343</p>	<p>Ans. 2300 625</p>
		<p>Ans. 1,675 dollars.</p>
<p> <math display="block">\begin{array}{r} 736 \\ 325 \\ \hline \end{array}</math> </p>		

Ans. 411 acres.

**Lesson 57.**

<p>(1)  <math display="block">\begin{array}{r} 35)700(20 \text{ months} \\ 70 \\ \hline 0 \end{array}</math></p>	<p>(2)  <math display="block">\begin{array}{r} 35 \\ 25 \\ \hline 1 0)70 0 \\ \hline \end{array}</math></p>	<p>(3)  <math display="block">\begin{array}{r} 2300 \\ 450 \\ 575 \\ \hline 3325 \end{array}</math></p>
	<p>Ans. 70 months.</p>	<p> <math display="block">\begin{array}{r} 1125 \\ 323 \\ \hline 3325 \\ 1448 \end{array}</math> </p>
		<p>Ans. 1,877 dollars.</p>
<p>(4)  <math display="block">\begin{array}{r} 5 000)4725 000 \\ \hline \end{array}</math></p>	<p>(5)  <math display="block">\begin{array}{r} 2250 \\ 4 \\ \hline 3)9000 \\ \hline \end{array}</math></p>	
<p>Ans. 945</p>	<p>Ans. 3,000 dollars.</p>	<p>(6)  <math display="block">\begin{array}{r} 150 \\ 60 \\ \hline \end{array}</math> </p>
		<p>Ans. 9,000 miles.</p>
<p>(7)  <math display="block">\begin{array}{r} 5 \\ 5 \\ \hline \end{array}</math></p>	<p>(8)  <math display="block">\begin{array}{r} 2581 \\ 37 \\ 583 \\ \hline 10000 \\ 12 \\ \hline \end{array}</math></p>	<p>(9)  <math display="block">\begin{array}{r} 12 \\ 300 \\ \hline \end{array}</math></p>
<p> <math display="block">\begin{array}{r} 225 \\ 225 \\ \hline \end{array}</math> </p>	<p>Ans. 13,213</p>	<p>Ans. 3,600 dol- [ars.</p>
		<p>Ans. 1,285,713</p>

## COMMON FRACTIONS.

## Lesson 62.

(5) 5)6	(6) 3)5	(7) 8)35	(8) 6)911	(9) 21)73(3 $\frac{1}{2}$	Ans.
<u>        </u>	<u>        </u>	<u>        </u>	<u>        </u>	63	
Ans. 1 $\frac{1}{5}$ dollar.	Ans. 1 $\frac{2}{3}$	Ans. 4 $\frac{3}{8}$	Ans. 151 $\frac{5}{6}$	<u>        </u>	
				19	

(10) 1)0)2)7	(11) 12)33(2 $\frac{9}{12}$	(12) 185)2700(14 $\frac{10}{185}$	Ans.
<u>        </u>	24	185	
Ans. 2 $\frac{7}{10}$	<u>        </u>	850	
	9	740	
	12	<u>        </u>	
		110	

## Lesson 63.

(6) 4 $\frac{1}{20}$	(7) 873 $\frac{1}{4}$	(8) 35	(9) 12 $\frac{5}{8}$	(10) 15 $\frac{6}{16}$	(11)	(12)
4	873	35	12	15	43	4
20	7	3	8	16	6	5
<u>        </u>	<u>        </u>	<u>        </u>	<u>        </u>	<u>        </u>	<u>        </u>	<u>        </u>
80	6111	105	96	90	258	9
1	4	Ans. 10 $\frac{5}{3}$	5	15	Ans. 25 $\frac{8}{6}$	8
<u>        </u>	<u>        </u>		<u>        </u>	<u>        </u>		<u>        </u>
81	6115		101	240		72
Ans. 8 $\frac{1}{20}$	Ans. 61 $\frac{15}{7}$		Ans. 10 $\frac{1}{8}$	6		3
				<u>        </u>		<u>        </u>
				246		75
				Ans. 24 $\frac{6}{16}$		Ans. 7 $\frac{5}{8}$

## Lesson 64.

(6) 1)0)48)0	(7) 24)39(1 $\frac{5}{24}$ day	(8) 2)27	Ans.
<u>        </u>	24	<u>        </u>	
Ans. 48	<u>        </u>	Ans. 13 $\frac{1}{2}$	
	15		
	24		
(9) 23)18883(821	(10) Ans. 900	(11) 192)86457(450 $\frac{57}{192}$	(12) 12)137(11 $\frac{5}{12}$
184 [Ans.		768 [Ans.	12 [Ans.
<u>        </u>		<u>        </u>	<u>        </u>
48		965	17
46		960	12
<u>        </u>		<u>        </u>	<u>        </u>
23		57	12
23		192	

**Lesson 66.**

$$\begin{array}{r} \text{(2)} \\ 12 \overline{)44} (3 \quad 4) \frac{12}{11} (\frac{3}{11} \text{ [Ans.} \end{array}$$

$$\begin{array}{r} 8 \overline{)12} (1 \\ 8 \end{array}$$

$$\begin{array}{r} 4 \overline{)8} (2 \\ 8 \end{array}$$

$$\begin{array}{r} \text{(5)} \\ 14 \overline{)35} (2 \quad 7) \frac{14}{13} (\frac{2}{13} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 7 \overline{)14} (2 \\ 14 \end{array}$$

$$\begin{array}{r} \text{(6)} \\ 128 \overline{)156} (1 \quad 4) \frac{128}{115} (\frac{3}{115} \text{ [Ans.} \end{array}$$

$$\begin{array}{r} 28 \overline{)128} (4 \\ 112 \end{array}$$

$$\begin{array}{r} 16 \overline{)28} (1 \\ 16 \end{array}$$

$$\begin{array}{r} 12 \overline{)16} (1 \\ 12 \end{array}$$

$$\begin{array}{r} 4 \overline{)12} (3 \\ 12 \end{array}$$

$$\begin{array}{r} \text{(8)} \\ 10 \overline{)100} (10 \quad 10) \frac{10}{100} (\frac{1}{10} \text{ Ans.} \end{array}$$

$$\begin{array}{r} \text{(10)} \\ 343 \overline{)7280} (21 \quad 7) \frac{343}{7280} (\frac{1}{1040} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 420 \\ 343 \end{array}$$

$$\begin{array}{r} 77 \overline{)343} (4 \\ 308 \end{array}$$

$$\begin{array}{r} 35 \overline{)77} (2 \\ 70 \end{array}$$

$$\begin{array}{r} 7 \overline{)35} (5 \\ 35 \end{array}$$

$$\begin{array}{r} \text{(3)} \\ 116 \overline{)224} (1 \quad 4) \frac{116}{224} (\frac{2}{56} \text{ [Ans.} \end{array}$$

$$\begin{array}{r} 108 \overline{)116} (1 \\ 108 \end{array}$$

$$\begin{array}{r} 8 \overline{)108} (13 \\ 8 \end{array}$$

$$\begin{array}{r} 28 \\ 24 \end{array}$$

$$\begin{array}{r} 4 \overline{)8} (2 \\ 8 \end{array}$$

$$\begin{array}{r} \text{(7)} \\ 35 \overline{)1250} (35 \quad 5) \frac{1250}{35} (\frac{2}{7} \text{ [Ans.} \end{array}$$

$$\begin{array}{r} 200 \\ 175 \end{array}$$

$$\begin{array}{r} 25 \overline{)35} (1 \\ 25 \end{array}$$

$$\begin{array}{r} 10 \overline{)25} (2 \\ 20 \end{array}$$

$$\begin{array}{r} 5 \overline{)10} (2 \\ 10 \end{array}$$

$$\begin{array}{r} \text{(9)} \\ 55 \overline{)165} (3 \quad 55) \frac{55}{165} (\frac{1}{3} \text{ Ans.} \end{array}$$

$$\begin{array}{r} \text{(11)} \\ 12 \overline{)128} (10 \quad 4) \frac{128}{12} (\frac{3}{3} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 8 \overline{)12} (1 \\ 8 \end{array}$$

$$\begin{array}{r} 4 \overline{)8} (2 \\ 8 \end{array}$$

$$\begin{array}{r} \text{(12)} \\ 162 \overline{)567} (3 \quad 81) \frac{162}{567} (\frac{2}{7} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 81 \overline{)162} (2 \\ 162 \end{array}$$

## Lesson 67.

$$\begin{array}{r}
 \text{(2)} \\
 \frac{6}{7} \text{ and } \frac{7}{6} \\
 \hline
 42 \quad 35 \quad 18 \\
 \text{Ans. } \frac{35}{42} \text{ and } \frac{18}{42}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 \frac{2}{3}, \frac{1}{3}, \frac{2}{2}, \frac{3}{2}, \text{ and } \frac{4}{2} \\
 \hline
 6 \quad 3 \quad 4 \quad 6 \quad 8 \\
 4 \quad 4 \quad 4 \quad 3 \quad 3
 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \\
 \frac{2}{4} \\
 \hline
 8 \\
 1 \\
 \hline
 9
 \end{array}$$

$$\begin{array}{r}
 \text{(5)} \\
 \frac{31}{3} \text{ and } \frac{61}{5} \\
 \hline
 9 \quad 30 \\
 1 \quad 1
 \end{array}$$

$$\begin{array}{r}
 24 \quad 12 \quad 16 \quad 18 \quad 24 \\
 5 \quad 5 \quad 5 \quad 5 \quad 4 \\
 \hline
 120 \quad 60 \quad 80 \quad 90 \quad 96 \\
 \text{Ans. } \frac{60}{120}, \frac{80}{120}, \frac{90}{120}, \text{ and } \frac{96}{120}
 \end{array}$$

$$\begin{array}{r}
 \frac{2}{4} \text{ and } \frac{5}{5} \\
 \hline
 4 \quad 9 \quad 5 \\
 8 \quad 8 \quad 4 \\
 \hline
 32 \quad 72 \quad 20 \\
 \text{Ans. } \frac{72}{32} \text{ and } \frac{20}{32}
 \end{array}$$

$$\begin{array}{r}
 \frac{10}{3} \text{ and } \frac{31}{5} \\
 \hline
 3 \quad 10 \quad 31 \\
 5 \quad 5 \quad 3 \\
 \hline
 15 \quad 50 \quad 93 \\
 \text{Ans. } \frac{50}{15} \text{ and } \frac{93}{15}
 \end{array}$$

$$\begin{array}{r}
 \text{(6)} \\
 \frac{4}{3}, \frac{5}{7}, \text{ and } \frac{1}{2} \\
 \hline
 3 \quad 4 \quad 5 \quad 1 \\
 7 \quad 7 \quad 3 \quad 3 \\
 \hline
 21 \quad 28 \quad 15 \quad 3 \\
 2 \quad 2 \quad 2 \quad 7 \\
 \hline
 42 \quad 56 \quad 30 \quad 21 \\
 \text{Ans. } \frac{56}{42}, \frac{30}{42}, \text{ and } \frac{21}{42}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \frac{8}{8} \text{ and } \frac{2}{3} \\
 \hline
 8 \\
 3 \\
 \hline
 24 \\
 \text{Ans. } \frac{24}{8} \text{ and } \frac{2}{3}
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 \frac{7}{2}, \frac{5}{4}, \text{ and } \frac{1}{3} \\
 \hline
 14 \quad 20 \quad 3 \\
 1 \quad 1 \quad 1 \\
 \hline
 15 \quad 21 \quad 4 \\
 \frac{15}{2}, \frac{21}{4}, \text{ and } \frac{4}{3} \\
 \hline
 2 \quad 15 \quad 21 \quad 4 \\
 4 \quad 4 \quad 2 \quad 2 \\
 \hline
 8 \quad 60 \quad 42 \quad 8 \\
 3 \quad 3 \quad 3 \quad 4 \\
 \hline
 24 \quad 180 \quad 126 \quad 32 \\
 \text{Ans. } \frac{180}{24}, \frac{126}{24}, \text{ and } \frac{32}{24}
 \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 \frac{256}{125} \text{ and } \frac{81}{125} \\
 \hline
 1280 \quad 750 \quad 256 \\
 512 \quad 375 \quad 2048 \\
 256 \quad 4500 \quad 20736 \\
 32000 \\
 \text{Ans. } \frac{4500}{32000} \text{ and } \frac{20736}{32000}
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 \frac{1}{2}, \frac{1}{4}, \text{ and } \frac{1}{8} \\
 \text{Ans. } \frac{4}{8}, \frac{2}{8}, \text{ and } \frac{1}{8}
 \end{array}$$

$$\begin{array}{r}
 \text{(11)} \\
 \frac{160}{2500}, \frac{180}{2500}, \text{ and } \frac{9}{25} \\
 \text{Ans. } \frac{160}{2500}, \frac{180}{2500}, \text{ and } \frac{900}{2500}
 \end{array}$$

$$\begin{array}{r}
 \text{(12)} \\
 \frac{3}{10} \text{ and } \frac{2}{15} \\
 \text{Ans. } \frac{9}{30} \text{ and } \frac{4}{30}
 \end{array}$$

$$\begin{array}{r}
 \text{(13)} \\
 \frac{1}{2}, \frac{1}{4}, \frac{3}{8}, \frac{2}{10}, \text{ and } \frac{2}{30} \\
 \text{Ans. } \frac{20}{40}, \frac{10}{40}, \frac{15}{40}, \frac{8}{40}, \text{ and } \frac{6}{40}
 \end{array}$$

## Lesson 68.

(6)				(7)			(8)				
	$\frac{5}{8}$ ,	$\frac{2}{7}$ ,	and $\frac{4}{5}$		$\frac{3}{4}$	and $\frac{1}{3}$		$\frac{1}{2}$ ,	$\frac{2}{3}$ ,	$\frac{3}{4}$ ,	and $\frac{4}{5}$
8	5	2	4	4	3	1	2	1	2	3	4
7	7	8	8	3	3	4	3	3	2	2	2
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
56	35	16	32	12	9	4	6	3	4	6	8
5	5	5	7		$\frac{9}{12}$	and $\frac{4}{12}$	4	4	4	3	3
<hr/>	<hr/>	<hr/>	<hr/>	9			<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
280	175	80	224	4			24	12	16	18	24
	$\frac{175}{280}$ ,	$\frac{80}{280}$ ,	and $\frac{224}{280}$	<hr/>			5	5	5	5	4
	175			12)	13	( $1\frac{1}{12}$	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	80				12	$2\frac{1}{12}$	120	60	80	90	96
	224				<hr/>	2		$\frac{60}{120}$ ,	$\frac{80}{120}$ ,	$\frac{90}{120}$ ,	$\frac{96}{120}$
	<hr/>			$\frac{1}{12}$	<hr/>						
280)479	( $1\frac{1}{2}$ )	yard	Ans.		$5\frac{1}{12}$	bushels		60			
280						[Ans.		80			
<hr/>								90			
	$\frac{180}{280}$							96			

$$120)326(2\frac{86}{120} \text{ or } 2\frac{43}{60} \\ 240 \quad \text{[Ans.]}$$

$$\frac{86}{120}$$

(9)

$$\frac{1}{4}, \frac{1}{2}, \frac{1}{8}, \text{ and } \frac{1}{10} \\ \text{or } \frac{10}{40}, \frac{20}{40}, \frac{5}{40}, \text{ and } \frac{4}{40}$$

$$\begin{array}{r} 10 \\ 20 \\ 5 \\ 4 \\ \hline 39 \\ \frac{39}{40} \end{array} \quad \text{Ans. } 5\frac{39}{40}$$

(10)

$$\frac{1}{2} \text{ and } \frac{3}{4} \\ \text{or } \frac{2}{4} \text{ and } \frac{3}{4}$$

$$\begin{array}{r} 2 \\ 3 \\ \hline 5 \\ \frac{5}{4} \text{ or } 1\frac{1}{4} \end{array} \quad \begin{array}{r} 1\frac{1}{4} \\ 12 \\ 9 \\ \hline \end{array}$$

Ans.  $22\frac{1}{4}$

(11)

$$\frac{4}{10}, \frac{17}{10}, \frac{3}{10} \text{ and } \frac{9}{10}$$

$$\begin{array}{r} 4 \\ 17 \\ 3 \\ 9 \\ \hline 33 \\ \frac{33}{10} \end{array} \quad \begin{array}{r} 10)33 \\ \hline \end{array}$$

Ans.  $3\frac{3}{10}$

(12)

$$\frac{8}{80}, \frac{3}{20}, \text{ and } \frac{1}{5} \\ \text{or } \frac{8}{80}, \frac{12}{80}, \text{ and } \frac{16}{80}$$

$$\begin{array}{r} 9 \\ 12 \\ 16 \\ \hline 37 \\ \frac{37}{80} \end{array} \quad \text{Ans.}$$

(13)

$$\frac{3}{4}, \frac{5}{11}, \frac{7}{12}, \frac{1}{3}, \text{ and } \frac{18}{100}.$$

$$\begin{array}{l} \frac{3}{4}, \frac{5}{11}, \frac{7}{12}, \text{ and } \frac{1}{3} \\ \text{are } \frac{9}{12}, \frac{7}{12}, \text{ and } \frac{4}{12}, \\ \text{or } \frac{2}{3} \text{ or } \frac{10}{6} \text{ or } \frac{5}{3} \end{array}$$

	$\frac{5}{11}$ ,	$\frac{5}{11}$ ,	and $\frac{18}{100}$
11	11	5	18
3	5	3	3
<hr/>	<hr/>	<hr/>	<hr/>
33	55	15	54
100	100	100	11
<hr/>	<hr/>	<hr/>	<hr/>
common denom. 3300	5500	1500	54
			594
	$\frac{5500}{3300}$	$\frac{1500}{3300}$	$\frac{594}{3300}$

(Carried over.)



### COMMON FRACTIONS.

(Brought over.)

$$\begin{array}{r} 5500 \\ 1500 \\ 594 \\ \hline 3300 \overline{) 7594} \begin{array}{l} 2 \\ 2 \\ 2 \end{array} \begin{array}{l} 884 \\ 884 \\ 884 \end{array} \\ 6600 \\ \hline 994 \\ 3300 \end{array}$$

## Lesson 69.

<p>(6)</p> $\begin{array}{r} \frac{3}{4} \text{ from } \frac{19}{20} \\ \text{or } \frac{15}{20} \text{ from } \frac{19}{20} \\ \hline 4 \\ \text{Ans. } \frac{4}{20} \text{ or } \frac{1}{5} \text{ of an acre.} \end{array}$	<p>(7)</p> $\begin{array}{r} 12\frac{1}{2} \text{ from } 16\frac{1}{3} \\ \text{or } 12\frac{3}{6} \text{ from } 16\frac{2}{6} \\ \hline 16\frac{2}{6} \\ 12\frac{3}{6} \\ \hline 4\frac{1}{6} \\ \text{Ans. } 3\frac{1}{6} \text{ barrels.} \end{array}$	<p>(8)</p> $\begin{array}{r} 5 \\ 1\frac{1}{2} \\ \hline \text{Ans. } 3\frac{3}{4} \text{ dollars.} \end{array}$	<p>(9)</p> $\begin{array}{r} \frac{6}{1000} \text{ from } \frac{45}{1000} \\ \hline 45 \\ 6 \\ \hline 39 \\ \text{Ans. } \frac{39}{1000} \end{array}$
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(10)		(11)
$3\frac{3}{4}$ from $10\frac{9}{10}$		$1\frac{8}{9}$ from $4\frac{8}{6}$
or $3\frac{15}{20}$ from $10\frac{18}{20}$	95	18
	56	48
$10\frac{18}{20}$		56
$3\frac{15}{20}$		
<hr/>	<hr/>	<hr/>
Ans. $7\frac{3}{20}$ dollars.	570	108
	475	90
	<hr/>	<hr/>
	5320	1008
		<hr/>
		4560
		1008
		<hr/>
		3552
		<hr/>
		Ans. $3\frac{552}{3520}$

<p><b>(12)</b></p> $\begin{array}{r} \frac{1}{16} \text{ from } \frac{1}{2} \\ \text{or } \frac{3}{48} \text{ from } \frac{4}{48} \\ \hline 4 \\ \hline 3 \\ \hline 1 \\ \hline \text{Ans. } \frac{1}{48} \text{ the most.} \end{array}$	<p><b>(13)</b></p> $\begin{array}{r} \frac{7}{1800} \text{ from } 35 \frac{1}{1777} \\ \hline 1777 \qquad 1777 \qquad 1800 \\ \hline \qquad 7 \qquad \qquad 1 \\ \hline 14216 \qquad \qquad \qquad 1439 \qquad \qquad 1800 \\ \hline 1777 \qquad \qquad \qquad 12439 \qquad \qquad 1800 \\ \hline 3198600 \qquad \frac{12439}{3198600} \text{ from } 35 \frac{1800}{3198600} \\ \hline \end{array}$ <p>Add 1 to <math>3198600 \dots 3198600</math></p> <p>Subtract <math>3198600 \dots 12439</math></p> <p style="text-align: right;">3187961</p> <p style="text-align: right;">Ans. <math>34 \frac{3187961}{3198600}</math></p>
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## Lesson 70.

<p>(6)</p> $\begin{array}{r} \frac{3}{8} \text{ and } 48 \\ 48 \\ 3 \\ \hline 144 \\ \frac{144}{16} \end{array}$ <p>16)144(9 bushels 144 [Ans.</p>	<p>(7)</p> $\begin{array}{r} 5 \text{ and } \frac{4}{5} \\ 5)25 \\ \hline 5 \\ \text{Ans. } \frac{4}{5} \end{array}$	<p>(8)</p> $\begin{array}{r} 25 \text{ and } 2\frac{3}{8} \\ 25 \quad 25)50(2 \quad 2\frac{3}{8} \text{ or } 19 \\ \hline 2 \quad 50 \\ 50 \\ \hline 19 \\ \text{Ans. } \frac{19}{69} \end{array}$
<p>(9)</p> $\begin{array}{r} \frac{1}{8} \text{ and } 2400 \\ 8)2400 \\ \hline \text{Ans. } 300 \text{ dollars.} \end{array}$	<p>(10)</p> $\begin{array}{r} \frac{1}{2} \text{ and } 30 \\ 30 \\ 4 \\ \hline 120 \\ \frac{120}{5} \end{array}$ <p>5)120(24 Ans.</p>	<p>(11)</p> $\begin{array}{r} 45 \text{ and } \frac{17}{100} \\ 45)900(20 \quad \text{Ans. } \frac{17}{100} \\ \hline 90 \\ 90 \\ \hline 0 \end{array}$
<p>(12)</p> $\begin{array}{r} 16000 \text{ and } \frac{2}{150} \\ 16000 \\ 3 \\ \hline 48000 \\ \frac{48000}{150} \end{array}$ <p>150)48000(320 acres Ans. 450 300 300 0</p>	<p>(13)</p> $\begin{array}{r} \frac{1}{5} \text{ of } 487 \\ 20 \\ 20 \\ \hline 487 \\ 14 \\ \hline 1948 \\ 487 \\ \hline 6818 \\ \frac{6818}{15} \end{array}$ <p>15)6818(454\frac{8}{15} Ans. 60 81 75 68 60 8 15</p>	

## Lesson 71.

<p>(6)</p> $\begin{array}{r} \frac{5}{12} \text{ and } \frac{4}{5} \\ 12 \quad 5 \\ 5 \quad 4 \\ \hline 60 \quad 20 \\ \frac{20}{60} \text{ or } \frac{1}{3} \text{ Ans.} \end{array}$	<p>(7)</p> $\begin{array}{r} 3\frac{1}{2} \text{ and } \frac{1}{2} \\ 3 \quad 1 \\ 2 \quad 1 \\ \hline 6 \quad 2 \\ 1 \quad 1 \\ \hline 7 \quad 3 \\ \frac{3}{7} \text{ and } \frac{1}{2} \\ 2 \quad 7 \\ 2 \quad 1 \\ \hline 4 \quad 7 \end{array}$ <p>7 4)7(1\frac{3}{4} dollar 4 [Ans. 3 4</p>	<p>(8)</p> $\begin{array}{r} 2\frac{1}{3} \text{ and } 1\frac{2}{5} \\ 2 \quad 1 \\ 3 \quad 5 \\ \hline 6 \quad 5 \\ 1 \quad 2 \\ \hline 7 \quad 7 \\ \frac{7}{3} \text{ and } \frac{7}{5} \\ 3 \quad 7 \\ 5 \quad 7 \\ \hline 15 \quad 49 \\ \frac{49}{15} \end{array}$ <p>15)49(3\frac{4}{15} [Ans. 45 4 15</p>
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(9)

$$\begin{array}{r} \frac{2}{5}, \frac{2}{4}, \text{ and } \frac{5}{8} \\ 5 \quad 2 \\ 4 \quad 3 \\ \hline 20 \quad 6 \\ 8 \quad 5 \\ \hline 160 \quad 30 \\ \text{Ans. } \frac{30}{160} \text{ or } \frac{3}{16} \end{array}$$

(10)

$$\begin{array}{r} \frac{1}{2}, \frac{2}{3}, \text{ and } \frac{7}{9} \\ 2 \quad 1 \\ 3 \quad 2 \\ \hline 6 \quad 2 \\ 9 \quad 7 \\ \hline 54 \quad 14 \\ \frac{1}{2} \quad 2) \frac{14}{27} \text{ Ans.} \end{array}$$

(11)

$$\begin{array}{r} \frac{9}{10} \text{ and } \frac{2}{5} \\ 10 \quad 9 \\ 5 \quad 3 \\ \hline 50 \quad 27 \\ \text{Ans. } \frac{27}{50} \end{array}$$

(12)

$$\begin{array}{r} 25\frac{1}{4} \text{ and } 7\frac{1}{2} \\ 25 \quad 7 \\ 4 \quad 2 \\ \hline 100 \quad 14 \\ 1 \quad 1 \\ \hline 101 \quad 15 \\ \frac{101}{4} \text{ and } \frac{15}{2} \\ 4 \quad 101 \\ 2 \quad 15 \\ \hline 8 \quad 505 \\ 101 \\ \hline 1515 \\ \frac{1515}{8} \end{array}$$

8)1515

Ans.  $189\frac{3}{8}$  dollars.

(13)

$$\begin{array}{r} 27\frac{5}{8} \text{ and } 400\frac{1}{7} \\ 128 \quad 111 \\ 4007 \quad 275 \\ \hline 896 \quad 555 \\ 512 \quad 777 \\ \hline 512896 \quad 222 \\ \hline 30525 \\ \text{Ans. } \frac{30525}{512896} \end{array}$$

**Lesson 72.**

(6)

$$\begin{array}{r} \frac{1}{2} \text{ by } 10 \\ 2 \\ 10 \\ \hline 20 \\ \text{Ans. } \frac{1}{20} \end{array}$$

(7)

$$\begin{array}{r} 5\frac{3}{8} \text{ by } 4 \\ 5 \quad 8 \\ 40 \\ 3 \\ \hline 43 \\ \frac{43}{8} \text{ by } 4 \\ 8 \\ 4 \\ \hline 32 \\ \text{Ans. } \frac{43}{32} \end{array}$$

(8)

$$\begin{array}{r} \frac{49}{8} \text{ by } 7 \\ 7)49 \\ \hline 7 \\ \text{Ans. } \frac{7}{8} \end{array}$$

(9)

$$\begin{array}{r} 1\frac{4}{12} \text{ by } 17 \\ 12 \\ 17 \\ \hline 84 \\ 12 \\ \hline 204 \\ \text{Ans. } \frac{145}{204} \end{array}$$

(10)

$$\begin{array}{r} \frac{19}{20} \text{ by } 5 \\ 20 \\ 5 \\ \hline 100 \\ \text{Ans. } \frac{19}{100} \end{array}$$

(11)  
100 by 25

$$\begin{array}{r} 100 \\ 8 \end{array}$$

$$\begin{array}{r} 800 \\ 5 \end{array}$$

$$\begin{array}{r} 805 \\ 25 \end{array}$$

 $\frac{805}{25}$  by 25

$$\begin{array}{r} 25 \\ 8 \end{array}$$

$$\begin{array}{r} 200 \\ 25 \end{array}$$

 $\frac{200}{25}$  200)805( $4\frac{1}{5}$  dollars Ans.

$$\begin{array}{r} 800 \\ 5 \end{array}$$

 $\frac{800}{5}$  or  $160$ 

(12)

 $\frac{105}{12}$  by 105

$$\begin{array}{r} 105 \\ 12 \end{array}$$

$$\begin{array}{r} 210 \\ 105 \end{array}$$

$$\begin{array}{r} 1260 \\ 12 \end{array}$$

Ans.  $1260$ 

(13)

 $\frac{175}{175}$  by 25

$$\begin{array}{r} 25)175(7 \\ 175 \end{array}$$

$$\begin{array}{r} 7 \\ 175 \end{array}$$

[Ans.

## Lesson 73.

(6)

56 by  $\frac{1}{8}$ 

$$\begin{array}{r} 56 \\ 8 \end{array}$$

$$\begin{array}{r} 7)448 \\ 7 \end{array}$$

Ans. 64

(7)

110 by  $5\frac{1}{2}$ 

$$\begin{array}{r} 5 \\ 2 \end{array}$$

$$\begin{array}{r} 10 \\ 1 \end{array}$$

$$\begin{array}{r} 11 \\ 11 \end{array}$$

$$\begin{array}{r} 110 \\ 2 \end{array}$$

11)220(20 Ans.  $\frac{3}{12}$  or  $\frac{1}{4}$ 

$$\begin{array}{r} 22 \\ 0 \end{array}$$

(8)

87 by  $1\frac{1}{5}$ 

$$\begin{array}{r} 87 \\ 5 \end{array}$$

$$\begin{array}{r} 12)435(36\frac{1}{2} \\ 36 \end{array}$$

[Ans.

$$\begin{array}{r} 75 \\ 72 \end{array}$$

(9)

100 by  $1\frac{1}{2}$ 

$$\begin{array}{r} 100 \\ 12 \end{array}$$

Ans. 1200

(10)

112 by  $\frac{3}{8}$ 

$$\begin{array}{r} 112 \\ 8 \end{array}$$

$$\begin{array}{r} 3)896 \\ 3 \end{array}$$

Ans. 298 $\frac{2}{3}$ 

(11)

42 by  $1\frac{3}{4}$ 

$$\begin{array}{r} 42 \\ 42 \end{array}$$

$$\begin{array}{r} 32 \\ 64 \end{array}$$

84)672(8 Ans.

$$\begin{array}{r} 672 \\ 0 \end{array}$$

(12)

62 by  $7\frac{3}{4}$ 

$$\begin{array}{r} 7 \\ 4 \end{array}$$

$$\begin{array}{r} 28 \\ 3 \end{array}$$

$$\begin{array}{r} 31 \\ 31 \end{array}$$

$$\begin{array}{r} 62 \\ 4 \end{array}$$

31)248(8 Ans.

$$\begin{array}{r} 248 \\ 248 \end{array}$$

(13)

25 by  $1\frac{1}{8}$ 

$$\begin{array}{r} 25 \\ 16 \end{array}$$

$$\begin{array}{r} 150 \\ 25 \end{array}$$

Ans. 400 miles.

## Lesson 74.

(6)

$$\begin{array}{r} \frac{9}{10} \text{ by } \frac{3}{20} \\ 3)9 \quad 3 \\ \hline \quad 20 \\ \quad 3 \quad \hline \quad \frac{3}{10} \quad 60 \\ \quad \frac{30}{10} \text{ or } 6 \text{ Ans.} \end{array}$$

(7)

$$\begin{array}{r} 6\frac{1}{5} \text{ by } \frac{3}{10} \\ 6 \quad 5 \\ 5 \quad 3 \\ \hline 30 \quad 15 \\ 4 \quad \frac{34}{15} \\ \hline 34 \quad 34 \\ 4\frac{3}{5} \quad 10 \\ \hline 340 \end{array}$$

(8)

$$\begin{array}{r} 10\frac{5}{10} \text{ by } 1\frac{1}{4} \\ 10 \quad 1 \\ 10 \quad 4 \\ \hline 100 \quad 4 \\ 5 \quad 1 \\ \hline 105 \quad 5 \\ 10\frac{5}{10} \text{ by } \frac{5}{4} \\ 5)105 \\ \hline 21 \\ 11 \\ 21 \\ 4 \\ \hline 84 \quad 10)84 \\ \hline 8\frac{4}{10} \text{ or } 8\frac{2}{5} \end{array}$$

(9)

$$\begin{array}{r} 22\frac{2}{5} \text{ by } 11\frac{7}{8} \\ 2 \quad 11 \\ 5 \quad 8 \\ \hline 10 \quad 88 \\ 2 \quad 7 \\ \hline 12 \quad 95 \\ 12\frac{2}{5} \text{ by } \frac{3\frac{5}{8}}{8} \\ 95 \\ 5 \\ \hline 475 \quad 12 \\ 47\frac{5}{8} \quad 8 \\ \hline 96 \end{array}$$

$$15)340(22\frac{2}{3} \text{ Ans.}$$

$$\begin{array}{r} 40 \\ 30 \\ \hline 10 \text{ or } \frac{2}{3} \end{array}$$

(10)

$$\begin{array}{r} \frac{5}{8} \text{ by } \frac{1}{8} \\ 5 \\ 8 \\ \hline 40 \\ 4\frac{0}{8} \quad 6)40 \\ \hline 6\frac{4}{8} \text{ or } 6\frac{2}{3} \text{ Ans.} \end{array}$$

(11)

$$\begin{array}{r} \frac{9}{15} \text{ by } \frac{3}{40} \\ 3)9 \\ \hline 3 \\ \frac{3}{15} \\ 40 \\ 3 \\ \hline 120 \\ 12\frac{0}{15} \quad 15)120(8 \text{ Ans.} \\ \hline 120 \end{array}$$

(12)

$$\begin{array}{r} \frac{9}{25} \text{ by } \frac{4}{5} \\ 4)8 \\ \hline 2 \\ \frac{2}{25} \\ 5)25 \\ \hline 5 \\ \text{Ans. } \frac{2}{5} \end{array}$$

(13)

$$\begin{array}{r} \frac{3\frac{5}{10}}{230} \text{ by } \frac{3}{100} \\ 230 \\ 3 \\ \hline 690 \\ \frac{3\frac{5}{10}}{690} \quad 35 \\ 100 \\ \hline 3500 \\ 3\frac{5\frac{0}{10}}{690} \quad 690)3500(5\frac{5}{69} \text{ Ans.} \\ \hline 3450 \\ \hline 10)\frac{50}{690}(\frac{5}{69} \end{array}$$

## DECIMAL FRACTIONS.

## Lesson 76.

(3) 4)3.0(.75 Ans. 28 — 20 20	(4) 2)3(1.5 Ans. 2 — 10 10	(5) 64)1.00(.015625 Ans. 64 — 360 320 — 400 384 — 160 128 — 320 320
(6) 12)45(3.75 Ans. 36 — 90 84 — 60 60	(7) 2400)3.000(.00125 Ans. 2400 — 6000 4800 — 12000 12000	
(8) 5)7(1.4 Ans. 5 — 20 20	(9) 8)5.0(.625 Ans. 48 — 20 16 — 40 40	(10) 25)14.0(.56 Ans. 2.56 125 — 150 150

## Lesson 77.

(2) 3)2.0(.6666 18 [.6667 nearly Ans. — 20 18 — 20 18 — 20 18 — 20 18	(3) 12)1.00(.0833 about 96 [Ans. — 40 36 — 40 36 — 4	(4) 7)13(1.857 about 7 [Ans. — 60 56 — 40 35 — 50 49 — 1
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<p>(5)</p> $\begin{array}{r} 1707) 121.00 \text{ (.07088459)} \\ \underline{11949} \text{ [.070885 nearly Ans.]} \\ 15100 \\ \underline{13656} \\ 14440 \\ \underline{13656} \\ 7840 \\ \underline{6828} \\ 10120 \\ \underline{8535} \\ 15850 \\ \underline{15363} \end{array}$	<p>(6)</p> $\begin{array}{r} 74) 311 \text{ (4.2 about Ans.)} \\ \underline{296} \\ 150 \\ \underline{148} \\ 2 \end{array}$
<p>(7)</p> $25) \frac{7.5}{100} \left( \frac{3}{4} \text{ Ans.} \right)$	<p>(8)</p> $125) \frac{0.0125}{1000000} \left( \frac{1}{8000} \text{ Ans.} \right)$
<p>(9)</p> $125) \frac{6.25}{10000} \left( \frac{1}{8} \text{ Ans.} \right)$	<p>(10)</p> $\begin{array}{r} \frac{36}{100} 4) \frac{36}{100} \left( \frac{9}{25} \text{ Ans. } 35\frac{9}{25} \right) \\ 36) 100(2 \\ \underline{72} \\ 28) 36(1 \\ \underline{28} \\ 8) 28(3 \\ \underline{24} \\ 4) 8(2 \\ \underline{8} \end{array}$
<p>(11)</p> $\begin{array}{r} \frac{688}{10000} 8) \frac{688}{10000} \left( \frac{88}{125} \text{ Ans.} \right) \\ 688) 1000(1 \\ \underline{688} \\ 312) 688(2 \\ \underline{624} \\ 64) 312(4 \\ \underline{256} \\ 56) 64(1 \\ \underline{56} \\ 8) 56(7 \\ \underline{56} \end{array}$	

**Lesson 78.**

<p>(2)</p> $\begin{array}{r} .00004 \\ .27 \\ 451. \\ \underline{13.003} \\ \text{Ans. } 464.27304 \end{array}$	<p>(3)</p> $\begin{array}{r} 4) 3.0 \\ \underline{\phantom{00}} \\ .75 \\ \underline{\phantom{00}} \\ .75 \\ .6667 \\ \underline{\phantom{00}} \\ .8 \\ \underline{\phantom{00}} \\ .5 \\ \underline{\phantom{00}} \\ 2.7167 \\ \text{Ans. } 2.717 \text{ dollars nearly.} \end{array}$	$\begin{array}{r} 3) 2.0 \\ \underline{\phantom{00}} \\ .6667 \\ \underline{\phantom{00}} \\ 5) 4.0 \\ \underline{\phantom{00}} \\ .8 \\ \underline{\phantom{00}} \\ 2) 1.0 \\ \underline{\phantom{00}} \\ .5 \end{array}$
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$\begin{array}{r} 4 \overline{)12} \\ 3 \end{array}$	<p>(4)</p> $\begin{array}{r} 9 \overline{)4.0} \\ .4444 \text{ \&c.} \end{array}$	$\begin{array}{r} 20 \overline{)17.0} \text{ (.85} \\ 160 \\ \hline 100 \\ 100 \end{array}$	<p>(5)</p> $\begin{array}{r} .875 \\ 2.0625 \\ .25 \\ \hline \end{array}$
	$\begin{array}{r} 7.9 \\ 3. \\ .4444 \text{ \&c.} \\ .85 \\ \hline \end{array}$		<p>Ans. 3.1875 cords.</p>
	<p>Ans. 12.1944 about.</p>		

<p>(6)</p> $\begin{array}{r} 27.01 \\ 251. \\ .3801 \\ 3.8 \\ \hline \end{array}$	<p>(7)</p> $\begin{array}{r} .75 \\ .25 \\ .50 \\ \hline 1.50 \end{array}$	<p>(8)</p> $\begin{array}{r} 5.75 \\ 4.008 \\ .0203 \\ \hline \end{array}$
<p>Ans. 282.1901</p>	<p>Ans. <math>1\frac{1}{2}</math></p>	<p>Ans. 9.7783</p>

<p>(9)</p> $\begin{array}{r} .4 \\ 17.20 \\ 6.002 \\ .0011 \\ \hline \end{array}$	<p>(10)</p> $\begin{array}{r} 2 \overline{)1.0} \\ .5 \\ \hline .5 \\ .125 \\ .75 \\ .1 \\ .05 \\ \hline \end{array}$	$\begin{array}{r} 8 \overline{)1.0} \\ .125 \\ \hline .125 \\ .75 \\ \hline \end{array}$	$\begin{array}{r} 4 \overline{)3.0} \\ .75 \\ \hline .75 \\ \hline \end{array}$	$\begin{array}{r} 20 \overline{)10.0} \text{ (.05} \\ 100 \end{array}$
<p>Ans. 23.6031</p>				
	<p>Ans. 1.525 dollar.</p>			

**Lesson 79.**

<p>(2)</p> $\begin{array}{r} 4. \\ 3.0175 \\ \hline \end{array}$	<p>(3)</p> $\begin{array}{r} 8 \overline{)5.0} \\ .625 \\ \hline .625 \\ .15 \\ \hline \end{array}$	<p>(4)</p> $\begin{array}{r} .875 \\ .75 \\ \hline \end{array}$
<p>Ans. .9825</p>	<p>Ans. .125 of a dollar.</p>	<p>Ans. .125 of a dollar.</p>

Ans. .475 of a dollar.



$$\begin{array}{r}
 \text{(5)} \\
 5) 4.0 \quad 3) 2.0 \text{ (.6 6 6 6 \&c.)} \\
 \underline{.8} \quad \underline{18} \\
 .8 \quad 20 \\
 \underline{.6667} \quad \underline{18} \\
 \text{Ans. .1333 a-} \quad 20 \\
 \text{[bout.} \quad \underline{18} \\
 \quad 20 \\
 \quad \underline{18}
 \end{array}$$
  

$$\begin{array}{r}
 \text{(6)} \\
 5 \quad .5 \\
 \underline{.375} \\
 \text{Ans. 4.5} \quad .0625 \\
 \underline{.3125} \text{ of a} \quad \text{(8)} \\
 \text{[dollar.} \quad \underline{17.375} \\
 \text{Ans. 6.37495} \quad \underline{11.00005}
 \end{array}$$
  

$$\begin{array}{r}
 \text{(9)} \\
 .625 \\
 \underline{.5625} \\
 .0625 \\
 \underline{.0625} \\
 .000000 \\
 \underline{100000} \\
 625) 10000(16 \\
 \underline{625} \\
 3750 \\
 \underline{3750}
 \end{array}$$
  

$$\begin{array}{r}
 \text{(10)} \\
 60) 55.0 \text{ (.9 1 6 6 \&c.)} \\
 \underline{540} \\
 100 \\
 \underline{60} \\
 400 \\
 \underline{360} \\
 400 \\
 \underline{360} \\
 40
 \end{array}$$
  

$$\begin{array}{r}
 12) 10.0 \text{ (.0833 \&c.)} \\
 \underline{96} \\
 40 \\
 \underline{36} \\
 40 \\
 \underline{36} \\
 4
 \end{array}$$
  

$$\begin{array}{r}
 625) 100000(16 \text{ Ans.} \\
 \underline{625} \\
 3750 \\
 \underline{3750} \\
 100000(16 \text{ Ans.} \\
 \underline{625} \\
 3750 \\
 \underline{3750}
 \end{array}$$

## Lesson 80.

<b>(2)</b> .043 <u>12</u>	<b>(3)</b> 6.25 <u>8</u>	<b>(4)</b> .75 <u>.5</u>	<b>(5)</b> 1.75 <u>1.2</u>
86 <b>43</b> <u>      </u>	Ans. 50.00	Ans. .375 of [a dollar.	350 <u>175</u>
Ans. .516			Ans. 2100 dol- [lars.
<b>(6)</b> .6 <u>10</u>	<b>(7)</b> .003 <u>.0009</u>	<b>(8)</b> .125 <u>21</u>	
Ans. 6.0 dollars.	Ans. .0000027	125 <u>250</u>	
			Ans. 2.625 dollars.



**Lesson 82.**

(1) 3)27.15 Ans. 9.05 dol- [lars.	(2) 6)45 Ans. 7.5	(3) 1 6) 3.6 8 (.2 3 Ans. 3 2 4 8 4 8	(4) 2)432.54 Ans. 216.27 [acres.
(5) .048 5 6).240 Ans. .04	(6) 7.6 1 1 6 4 5 6 6 7 6 1 Ans. 1 2 1.7 6	(7) .36 3 2)108 Ans. 54	(8) .037 4 Ans. .148
(9) 4 8 Ans. 32 dollars.	(10) 8)5640 Ans. 705	(11) 4)11.6 Ans. 2.9 dollars.	(12) .43 3 Ans. 1.29

**PROMISCUOUS QUESTIONS IN FRACTIONS.****Lesson 83.**

(1)	(2)	(3)
[length, $\frac{1}{4}$ , $\frac{1}{2}$ , and 2 feet whole or $\frac{1}{4}$ , $\frac{2}{4}$ , and 2 feet, or $\frac{3}{4}$ and 2 feet. 2 feet then is $\frac{1}{4}$ 4 <hr/> Ans. 8 feet.	4)7 <hr/> Ans. $1\frac{3}{4}$ and 1.75	4 5 0 2 0 <hr/> Ans. 9,000 [dollars.
(4)	(5)	(6)
.9 .875 <hr/> Ans. .025	32.6666 &c. Ans. 32.667 nearly.	12 3 <hr/> 2)36 <hr/> Ans. 18
		(7)
		$\frac{1}{2}$ divide by $\frac{3}{4}$ 2 1 3 4 <hr/> 6 4 $\frac{4}{6}$ or $\frac{2}{3}$ Ans.

(8)

$9\frac{1}{4}$

9

4

36

1

37

$\frac{37}{4}$  4)16

4

4

4

16

148

Ans.  $\frac{148}{16}$

(9)

16)148(9

144

4)16(4

16

4)148( $\frac{37}{4}$  Ans.

(10)

or  $\frac{1}{16}, \frac{3}{8}, \frac{1}{4}$ , and  $\frac{3}{8}$ ,  
or  $\frac{1}{16}, \frac{6}{16}, \frac{4}{16}$ , and  $\frac{24}{16}$

1

6

4

24

35

$\frac{35}{16}$  16)35( $2\frac{3}{16}$  Ans.

32

$\frac{3}{16}$

(12)

$9\frac{5}{8}$  divide by  $\frac{7}{8}$

9

5

45

4

49

$\frac{49}{5}$  by  $\frac{7}{8}$

7)49

7

8

56

$\frac{56}{5}$  5)56( $11\frac{1}{5}$  Ans.

5

6

5

$\frac{1}{5}$

(13)

$11\frac{2}{3}$  divide by  $5\frac{2}{3}$

11

3

33

2

35

$\frac{35}{3}$  by  $\frac{23}{4}$

23

3

69

$\frac{140}{69}$  69)140( $2\frac{2}{69}$

138

$\frac{2}{69}$

[Ans.

(11)

$\frac{15}{100}$  15)100(6

90

10)15(1

10

5)15( $\frac{3}{2}$  5)10(2

[Ans.

10

# Lesson 84.

(1)

$9\frac{3}{4}$  and  $7\frac{1}{8}$   
or  $9\frac{12}{16}$  and  $7\frac{2}{16}$

$9\frac{12}{16}$

$7\frac{2}{16}$

$1\frac{13}{16}$  dollar Ans.

(2)

$\frac{1}{2}, \frac{1}{3}$ , and 2,000 dollars,  
or  $\frac{3}{6}, \frac{2}{6}$ , and 2,000 dollars,  
or  $\frac{5}{6}$  and 2,000 dollars.

2,000 dollars then is  $\frac{1}{6}$

6

12,000 dollars Ans.

(3)

$\frac{3}{4}$  divide by  $\frac{3}{8}$

3)3

1

8

8

Ans.  $\frac{8}{4}$  or 2  
[bushels.

(4)

 $\frac{2}{3}$  of  $\frac{3}{4}$ 

3 3

8 2

---

24 6

 $\frac{6}{24}$  or  $\frac{1}{4}$  3000

4

Ans. 12,000 dollars.

(5)

6)2472

Ans. 412

(6)

 $\frac{2}{3}$  read and write,  $\frac{1}{3}$  do not $\frac{2}{4}$  of  $\frac{1}{3}$ 

4 1

3 3

---

12 3

 $\frac{3}{12}$  or  $\frac{1}{4}$ 

$\frac{2}{3}$ ,  $\frac{1}{4}$ , and 5 scholars.  
 or  $\frac{2}{12}$ ,  $\frac{3}{12}$ , and 5 scholars.  
 or  $\frac{1}{12}$  and 5 scholars.

5 scholars then are  $\frac{1}{12}$ 

12

Ans. 60

(7)

516

7

3)3612

Ans. 1,204 dollars.

(8)

 $\frac{2}{4}$  of  $12\frac{1}{3}$ 

12

3

---

36

1

---

37

.875)7.000 (8 dollars

7000

[Ans.

 $\frac{2}{4}$  of  $\frac{37}{4}$ 

4 37

3 3

---

12 111

 $\frac{111}{12}$ 12)111( $9\frac{1}{4}$  dollars Ans.

108

 $\frac{3}{12}$  or  $\frac{1}{4}$ 

(9)

.375

4000

---

1500.000

.12

---

30

15

Ans. 180 dollars.

(11)

.625

.8

---

.5000

Ans. .5 of a dollar.

## Lesson 85.

(8)

 $\frac{1}{12}$  of 1800

1800

17

---

126

18

12)30600(2,550 dol-  
24 [lars Ans.

---

66

60

---

60

60

---

0

(9)

 $\frac{2}{3}$  of 8

8

3

---

2)24

 $\frac{5}{3}$  of 12

12

5

---

3)60

 $\frac{7}{5}$  of 20

20

7

---

5)140

Ans. second 12, third 20, fourth 28 dollars.

$$\begin{array}{r} \text{(10)} \\ 1\frac{5}{8} \text{ of } 180 \\ 180 \\ 150 \\ \hline 90 \\ 18 \\ \hline \end{array}$$

$$\begin{array}{r} 135)27000(200 \text{ pounds Ans.} \\ 270 \\ \hline 00 \end{array}$$

$$\begin{array}{r} \text{(11)} \\ 4\frac{5}{8} \text{ of } 4500(1 \\ 4500 \\ \hline 1500)4\frac{5}{8} \text{ of } 4500(\frac{3}{4} \text{ Ans. } 1500)4500(3 \\ 4500 \end{array}$$

Lesson 86.

$$\begin{array}{llll} \text{Ans. } \text{(1)} & \text{(2)} & \text{(3)} & \text{(4)} \\ \frac{64}{80} & 8 \overline{) 64} 0 & 5 \overline{) 80} (16 & \frac{1}{3} \quad \frac{1}{3} \quad \frac{2}{3} \\ & \text{Ans. 8 times.} & 5 & \frac{1}{3} \quad \frac{3}{3} \quad \frac{1}{3} \\ & & 30 & \frac{1}{3} \quad \frac{3}{3} \quad \frac{2}{3} \\ & & 30 & \text{Ans. } \frac{2}{3} \\ & & 5 \overline{) 80} (\frac{16}{8} \text{ Ans.} & \end{array}$$

$$\begin{array}{llll} \text{(5)} & & & \\ \begin{array}{r} 6\frac{3}{4} \quad 2\frac{1}{4} \\ 6 \quad 2 \\ 4 \quad 4 \\ \hline 24 \quad 8 \\ 3 \quad 1 \\ \hline 27 \quad 9 \\ 2\frac{7}{4} \quad \frac{9}{4} \\ \hline \end{array} & \begin{array}{r} 11\frac{1}{8} \\ 1 \\ 16 \\ \hline 16 \\ 11 \\ \hline 27 \\ 2\frac{7}{8} \\ \hline \end{array} & \begin{array}{r} 21\frac{3}{8} \\ 2 \\ 16 \\ \hline 32 \\ 13 \\ \hline 45 \\ 4\frac{5}{8} \\ \hline \end{array} \\ \text{John } \frac{2\frac{7}{4}}{4}, & \text{Samuel } \frac{2\frac{7}{8}}{4}, & \text{William } \frac{4\frac{5}{8}}{4} \\ \text{dividing} & \text{dividing} & \text{dividing} \\ \begin{array}{r} 27 \quad 9 \\ 4 \quad 4 \\ \hline 108 \quad 36 \\ \frac{36}{108} \end{array} & \begin{array}{r} 27 \overline{) 27} (1 \\ 4 \\ \hline 4 \\ \frac{4}{16} \end{array} & \begin{array}{r} 16 \\ 27 \\ \hline 112 \\ 32 \\ \hline 4 \overline{) 432} \\ 108 \end{array} \end{array}$$

$$\begin{array}{r} \text{Ans. John } \frac{3\frac{5}{8}}{108} \text{ or } \frac{1}{3}, \text{ Samuel } \frac{4}{16} \text{ or } \frac{1}{4}, \text{ and William } \frac{4\frac{5}{8}}{108} \text{ or } 9 \overline{) \frac{4\frac{5}{8}}{108}} (\frac{5}{12} \\ 45 \overline{) 108} (2 \\ 90 \\ \hline 18 \overline{) 45} (2 \\ 36 \\ \hline \text{Greatest common divisor, } 9 \overline{) 18} (2 \\ 18 \end{array}$$

(6)

$$.0625 \text{ or } \frac{1}{16}$$

dividing

$$\begin{array}{r} 16 \quad 1 \\ 1 \quad 4 \\ \hline 16 \quad 4 \end{array}$$

Ans.  $\frac{1}{16}$  or  $\frac{1}{4}$  or .25

(7)

$$\begin{array}{r} 16 \\ 19 \end{array}$$

$$2 \overline{)35}$$

Ans.  $17\frac{1}{2}$  bushels.

(8)

$$\text{or } \frac{3}{8}, \frac{7}{8}, 1, 1\frac{1}{2}, \text{ and } 1\frac{1}{2}$$

$$\begin{array}{r} 6 \\ 7 \\ 8 \\ 12 \\ 12 \\ \hline 45 \end{array}$$

dividing  $4\frac{1}{8}$  by 5  
in all  $4\frac{1}{8}$   $5 \overline{)45}$ 

$$\begin{array}{r} 9 \end{array}$$

Ans.  $\frac{9}{8}$  or  $1\frac{1}{8}$  dollar.

(9)

$$\begin{array}{r} 4712.25 \\ 4710.85 \\ 4713.11 \end{array}$$

$$3 \overline{)14136.21}$$

Ans. 4,712.07 feet.

(10)

$$\begin{array}{r} 9\frac{5}{8} \\ 9 \\ 8 \end{array}$$

$$6\frac{3}{16}, \text{ and } 7\frac{3}{16}$$

$$\begin{array}{r} 16 \quad 16 \\ 6 \quad 7 \end{array}$$

$$\begin{array}{r} 72 \\ 5 \end{array}$$

$$\begin{array}{r} 96 \\ 9 \end{array}$$

$$\begin{array}{r} 112 \\ 13 \end{array}$$

$$\begin{array}{r} 77 \\ 7\frac{7}{8} \\ \text{or } 1\frac{5}{16} \end{array}$$

$$\begin{array}{r} 105 \\ 1\frac{5}{16}, \text{ and } 1\frac{5}{16} \end{array}$$

$$\begin{array}{r} 125 \\ 1\frac{5}{16}, \text{ and } 1\frac{5}{16} \end{array}$$

$$\text{or } 1\frac{5}{16}$$

$$\begin{array}{r} 154 \\ 105 \\ 125 \end{array}$$

$$\begin{array}{r} 11 \\ 7 \\ 7 \end{array}$$

$$\begin{array}{r} 384 \\ 25 \end{array}$$

in all  $\frac{384}{16}$ dividing  $\frac{384}{16}$  by 25

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

$$\begin{array}{r} 16 \\ 25 \end{array}$$

$$\begin{array}{r} 80 \\ 32 \end{array}$$

$$\begin{array}{r} 400 \\ 384 \end{array}$$

(11)

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ 5 \\ 17 \\ 34 \end{array}$$

Greatest common divisor, 16)384(24

$$\begin{array}{r} 32 \end{array}$$

$$\begin{array}{r} 64 \end{array}$$

$$\begin{array}{r} 64 \end{array}$$

# FEDERAL MONEY.

## Lesson 88.

(4)	(5)	(6)
\$ 42	1,600 mills	2,317 cents
Ans. 420 dimes	Ans. 160 cents	Ans. \$ 23.17
Ans. 4,200 cents	Ans. 16 dimes	
Ans. 42,000 mills	Ans. \$ 1.6	
\$ 42.20	1,650 mills	
Ans. 422 dimes	Ans. 165 cents	
Ans. 4,220 cents	Ans. 16.5 dimes	
Ans. 42,200 mills	Ans. \$ 1.65	
\$ 42.25	(7)	(8)
Ans. 422.5 dimes	15	\$ 5,827.37
Ans. 4,225 cents	10	Ans. 582,737 cents
Ans. 42,250 mills	\$ 150	
\$ 42.259	Ans. 1,500 dimes	
Ans. 422.59 dimes	Ans. 15,000 cents	
Ans. 4,225.9 cents		
Ans. 42,259 mills	(9)	(10)
	83,254 mills	\$ 250
	Ans. \$ 83.254	Ans. 25,000

## Lesson 89.

(1)	(2)	(3)
1325.043	180.	274
2875	2.50	5)4.0(.8
835.		40
1750	Ans. \$ 177.50	27.8
.375		450
Ans. \$ 2,180.793		1390
		1112
(4)	(5)	
35) 45.25 (1.2928	13.75	4)33
35	4.334	8)211.6666 &c.
\$ 1.293 nearly	4	8.25
[Ans.	3	26.4583
210	55.00	
70	1	
325	1299	
315	55.	
100	13.	
70	8.25	
300	26.458	
280		
20	102.708 dollars about	



## REDUCTION OF COMPOUND NUMBERS.

<p>(6)</p> $\begin{array}{r} 1.25 \\ .41\frac{1}{2} \\ \hline .83\frac{1}{2} \text{ or } \frac{1}{2} \\ 42 \\ 5 \\ \hline 6)210 \\ \hline \text{Ans. } \$ 35 \end{array}$	<p>(7)</p> $\begin{array}{r} 26 \\ 13 \\ \hline 78 \\ 26 \\ \hline 6)338 \\ \hline \text{Ans. } 56.333 \text{ \&c.} \end{array}$	<p>(8)</p> $\begin{array}{r} 83 \\ .75 \\ \hline 415 \\ 581 \\ \hline 1.125)62.250 \text{ [Ans. } 55.333 \text{ \&c.} \\ 5625 \text{ [or } 55\frac{1}{3} \\ \hline 6000 \\ 5625 \\ \hline 3750 \\ 3375 \\ \hline 3750 \\ 3375 \\ \hline 375 \end{array}$
<p>(9)</p> $\begin{array}{r} 3777.04 \\ 12057 \\ .125 \\ \hline \text{Ans. } \$ 3,789.222 \end{array}$	<p>(10)</p> $\begin{array}{r} .3125 \\ 100 \text{ gals.} \\ \hline 312500 \\ 4 \text{ hhds.} \\ \hline 125.00 \end{array}$	
	$\begin{array}{r} 2500 \\ 1304.07 \\ 125 \\ 245 \\ 1250 \\ \hline 5424.07 \\ 4327.17 \\ \hline \text{Ans } \$ 1,096.90 \end{array}$	

## REDUCTION OF COMPOUND NUMBERS.

## Lesson 98.

<p>(1)</p> $\begin{array}{r} 28 \\ 16)36000(2250 \\ 32 \quad 224 \\ \hline 40 \quad 10 \text{ lbs. } 0 \\ 32 \\ \hline 80 \\ 80 \\ \hline 0 \end{array}$	<p>(2)</p> $\begin{array}{r} 5 \\ 20 \\ \hline 100 \\ 4 \\ \hline 400 \\ 28 \\ \hline 32 \\ 8 \\ \hline \text{Ans. } 11,200 \end{array}$	<p>(3)</p> $\begin{array}{r} 12 \\ 20)4312(215(17 \text{ lbs.} \\ 40 \quad 12 \\ \hline 31 \quad 95 \\ 20 \quad 84 \\ \hline 112 \quad 11 \text{ oz.} \\ 100 \\ \hline 12 \text{ pwts.} \end{array}$
--	--	--

$$\begin{array}{r}
 (4) \\
 6 \\
 20 \\
 \hline
 120 \\
 24 \\
 \hline
 48 \\
 24 \\
 \hline
 \text{Ans. } 2,880
 \end{array}$$

$$\begin{array}{r}
 (5) \\
 \text{lb } \frac{3}{4} \text{ 3 } \text{ } \text{ } \text{ } \text{ gr.} \\
 2 \text{ 4 } 2 \text{ 0 } 1 \\
 12 \\
 24 \\
 \text{Add } 4 \\
 \hline
 28 \\
 8 \\
 \hline
 224 \\
 \text{Add } 2 \\
 \hline
 226 \\
 3 \\
 \hline
 678 \\
 20 \\
 \hline
 13560 \\
 \text{Add } 1 \\
 \hline
 \text{Ans. } 13,561
 \end{array}$$

$$\begin{array}{r}
 (6) \\
 2|0)640 \\
 \hline
 3)32 - 29 \\
 \hline
 8)10 - 25 \\
 \hline
 1 \frac{3}{8}
 \end{array}$$

$$\begin{array}{r}
 (7) \\
 792 \\
 100 \\
 \hline
 165 \\
 12)792.00 \quad (66.0) (4 \text{ Ans.} \\
 72 \\
 \hline
 72 \\
 72
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 2 \\
 3 \\
 \hline
 6 \\
 8 \\
 \hline
 48 \\
 40 \\
 \hline
 1920 \\
 165 \\
 \hline
 960 \\
 1152 \\
 192 \\
 \hline
 6)31680.0 \\
 \hline
 \text{Ans. } 5,280
 \end{array}$$

$$\begin{array}{r}
 (9) \\
 16.5 \\
 6 \\
 \hline
 99.0 \text{ ft. long. } 66.0 \text{ ft. wide.} \\
 99 \\
 66 \\
 \hline
 594 \\
 594 \\
 \hline
 \$ \\
 16)6534(408.375 \text{ Ans.} \\
 64 \\
 \hline
 134 \\
 128 \\
 \hline
 60 \\
 48 \\
 \hline
 120 \\
 112 \\
 \hline
 80 \\
 80
 \end{array}$$

$$\begin{array}{r}
 (10) \\
 18 \\
 16 \\
 \hline
 108 \\
 18 \\
 \hline
 9)288 \\
 \hline
 \text{Ans. } 32
 \end{array}$$

## Lesson 99.

(1)	(2)	(3)	(4)
$\begin{array}{r} 3 \\ 2 \\ \hline 6 \end{array}$	$\begin{array}{r} 37 \\ 4 \\ \hline 148 \\ 5 \end{array}$	$\begin{array}{r} \text{bu. pks.} \\ 123 \\ 4 \\ \hline 48 \\ 3 \end{array}$	$\begin{array}{r} 36)112(3 \text{ chal.} \\ 108 \\ \hline 4 \end{array}$
$\begin{array}{r} 1728 \\ 6 \end{array}$	$\begin{array}{r} 148 \\ 5 \end{array}$	$\begin{array}{r} 51 \\ .50 \end{array}$	
Ans. 10,368	$\begin{array}{r} 8 \\ 16)740(46(5 \text{ C.} \\ 64 \quad 40 \\ \hline 100 \quad 6 \text{ ft.} \\ 96 \\ \hline 4 \text{ cubic ft.} \end{array}$	Ans. \$25.50	

(5)	(6)	(7)
$\begin{array}{r} \text{gals. qts. pt.} \\ 1231 \\ 4 \\ \hline 48 \\ 3 \\ \hline 51 \\ 2 \\ \hline 102 \\ 1 \end{array}$	$\begin{array}{r} 4)1313 - 1 \text{ qt.} \\ 9)328 - 4 \text{ gals.} \\ 36 \text{ fir.} \end{array}$	$\begin{array}{r} \text{tier. gals. qts.} \\ 252 \\ 42 \\ \hline 84 \\ 5 \\ \hline 89 \\ 4 \\ \hline 356 \\ 2 \end{array}$
$\begin{array}{r} \text{Ans. 103 pts.} \\ .02 \end{array}$		$\begin{array}{r} 2)358 \end{array}$
Ans. \$2.06		Ans. 179 days.

(8)

$$\begin{array}{r} 4)2217 - 1 \text{ qt.} \\ 63)554(8 \text{ hhds.} \\ 504 \\ \hline 50 \text{ gals.} \end{array}$$

$$\begin{array}{r}
 (9) \quad \begin{array}{r} 60 \quad 24 \quad 7 \\ 60)1000000(16666(277(11(1 \text{ w.} \\ \underline{60} \quad \underline{120} \quad \underline{24} \quad \underline{7} \\ 400 \quad 466 \quad 37 \quad 4 \text{ d.} \\ \underline{360} \quad \underline{420} \quad \underline{24} \\ 400 \quad 466 \quad 13 \text{ h.} \\ \underline{360} \quad \underline{420} \\ 400 \quad 46 \text{ min.} \\ \underline{360} \\ 400 \\ \underline{360} \\ 40 \text{ sec.} \end{array}
 \end{array}$$

$$\begin{array}{r}
 (10) \quad \begin{array}{r} \text{w. d. h. min. sec.} \\ 1 \quad 4 \quad 7 \quad 0 \quad 48 \\ \underline{7} \\ 7 \\ \underline{7} \\ 11 \\ \underline{24} \\ 44 \\ \underline{22} \\ 7 \\ \underline{271} \\ 60 \\ \underline{16260} \\ 60 \\ \underline{975600} \\ 48 \\ \underline{975648} \text{ sec.} \\ 20 \end{array} \\
 \text{Ans. } 19,512,960
 \end{array}$$

**Lesson 100.**

$$\begin{array}{r}
 (1) \quad \begin{array}{r} 17^{\circ} \quad 28' \quad 14'' \\ \underline{60} \\ 1020 \\ \underline{26} \\ 1046 \\ \underline{60} \\ 62760 \\ \underline{14} \\ \text{Ans. } 62,774 \end{array}
 \end{array}$$

$$\begin{array}{r}
 (4) \quad \begin{array}{r} 7)67-4 \text{ d.} \\ \underline{\phantom{00}} \\ 4)9-1 \text{ w.} \\ \underline{\phantom{00}} \\ 2 \text{ mo.} \end{array}
 \end{array}$$

$$\begin{array}{r}
 (2) \quad \begin{array}{r} 60 \\ 60)5700''(95(1^{\circ} \\ \underline{540} \quad \underline{60} \\ 300 \quad 35' \\ \underline{300} \end{array}
 \end{array}$$

$$\begin{array}{r}
 (5) \quad \begin{array}{r} 36 \\ 24 \\ \underline{144} \\ 72 \\ \underline{864} \\ 6 \\ 27)5184(192 \text{ Ans.} \\ \underline{27} \\ 248 \\ \underline{243} \\ 54 \\ \underline{54} \end{array}
 \end{array}$$

$$\begin{array}{r}
 (3) \quad \begin{array}{r} 1782 \\ 1776 \quad 27 \text{ July.} \\ \underline{6} \quad 31 \text{ Aug.} \\ 365 \quad 30 \text{ Sept.} \\ \underline{5} \quad 31 \text{ Oct.} \\ 1825 \quad 30 \text{ Nov.} \\ \underline{366} \quad 31 \text{ Dec.} \\ 200 \quad 20 \text{ Jan.} \\ \underline{200} \end{array} \\
 \text{Ans. } 2,391 \\
 (6) \quad \begin{array}{r} \text{C. ft.} \\ 3 \quad 7 \\ \underline{8} \\ 24 \\ \underline{7} \end{array} \\
 (7) \quad \begin{array}{r} \text{m. r.} \\ 1 \quad 33 \\ \underline{8} \\ 8 \\ \underline{40} \\ 320 \\ \underline{33} \\ \text{Ans. } 353 \end{array} \\
 \text{Ans. } \$ 31
 \end{array}$$

(8)  
 m. fath.  
 17 45  
 3)17—2 m. 2 45  
 — 8  
 5 lea. 16  
 40  
 640  
 16½  
 384  
 64  
 10240  
 320 — ½ of 640  
 6)10560  
 1760  
 45  
 Ans. 5 lea. 1,805 fath.

(9)  
 28  
 6  
 4)168  
 Ans. 42

(10) 9  
 144)453778(3151(350 sq. yds.  
 432 27  
 217 45  
 144 45  
 737 1 sq. ft.  
 720  
 178  
 144  
 34 sq. in.

## Lesson 101.

(1)  
 2)196 425  
 3600 98 98  
 1176 3400  
 588 3825  
 705600 41650  
 41650 4 20  
 28)747250(26687(6671(333 T.  
 56 24 60  
 187 26 67  
 168 24 60  
 192 28 71  
 168 28 60  
 245 7 11 cwt.  
 224 4  
 210 3 qrs.  
 196  
 14 lbs.

(2)  
 T. cwt. qrs. lbs.  
 3 0 2 17  
 20  
 60  
 4  
 240  
 2  
 242  
 28  
 1936  
 484  
 17  
 \$ .16½  
 or \$.1666, &c.  
 or \$ ⅙ . . . 6)6793  
 1132.1666, &c.  
 or \$ 1,132.16⅔ Ans.

(3)	(4)	(5)
12	5	5
7	4	5
<hr/>	<hr/>	<hr/>
84	20	25
20	8	5
<hr/>	<hr/>	<hr/>
Ans. 1,680	or $\$.12\frac{1}{2}$ or $\$.125$ or $\$.1$ 8)160	1728 125
	Ans. \$20	<hr/>
		8640
		3456
		1728
		<hr/>
(6)	(7)	2150.4)216000.0 (100.4464
2)35217 — 1 pt.	54	21504 [100.446
<hr/>	4	<hr/>
4)17608	$\$.50$	96000
<hr/>	or $\$.1$ 2)216	86016
54)4402 (81 hhds.	<hr/>	<hr/>
432	Ans. \$108	99840
<hr/>		86016
82		<hr/>
54		138240
<hr/>		129024
28 gals.		<hr/>
		92160
		86016
		<hr/>
		6144
		<hr/>
(8)	(9)	(10)
108	84	12
16	5	
<hr/>	<hr/>	
648	Ans. \$420	20)428(21 (1 lb.
108		40 12
<hr/>		<hr/>
1728		28 9 oz.
157.5		20
<hr/>		<hr/>
1885.5		8 pwts.
or 1,885 $\frac{1}{2}$ Ans.		

## Lesson 103.

(1) 3 qrs. 16 lbs.  
 or  $3\frac{16}{8}$  qrs.  
 changing to an improper fraction  

$$\begin{array}{r} 28 \\ 3 \overline{) 84} \\ 16 \\ \hline 100 \end{array}$$
  
 dividing  $1\frac{20}{8}$  qrs. by 4)100  

$$\begin{array}{r} 25 \\ 4 \overline{) 100} \end{array}$$
  
 dividing  $2\frac{1}{2}$  cwt. by 20  

$$\begin{array}{r} 28 \\ 20 \overline{) 560} \\ 560 \\ \hline 0 \end{array}$$
  
 5)  $2\frac{5}{8}$  (112 T.  

$$\begin{array}{r} 5 \\ 60 \overline{) 300} \\ 300 \\ \hline 0 \end{array}$$
  
 112)300(2.678  

$$\begin{array}{r} 224 \\ 760 \overline{) 760} \\ 760 \\ \hline 0 \end{array}$$
  

$$\begin{array}{r} 880 \\ 784 \overline{) 880} \\ 784 \\ \hline 960 \\ 896 \end{array}$$

(2) .25  
 or  $\frac{1}{4}$  4)28  
 Ans. 7

(3)  $14\frac{14}{12}$   

$$\begin{array}{r} 14 \\ 12 \overline{) 14} \\ 28 \\ 14 \end{array}$$
  
 35)168(4 oz.  

$$\begin{array}{r} 140 \\ 28 \\ 20 \end{array}$$
  
 35)560(16 pwts.  

$$\begin{array}{r} 35 \\ 210 \\ 210 \end{array}$$

(4) pwts. qrs.  
 13 3  
 24)3.0(.125 20)13.125(.65625 of an  

$$\begin{array}{r} 24 \\ 60 \\ 48 \end{array}$$
  

$$\begin{array}{r} 112 \\ 100 \end{array}$$
  

$$\begin{array}{r} 120 \\ 120 \end{array}$$
  

$$\begin{array}{r} 50 \\ 40 \end{array}$$
  

$$\begin{array}{r} 100 \\ 100 \end{array}$$
  
 [ounce Ans. 10]

(5)	(6)	(7)
qrs. nails	.1 3 2 5	
3 3	8	40
or $3\frac{1}{4}$ qrs.		10
3	fur. 1.0 6 0 0	16) 640 (40 A., worth \$ 400
4	40	64 [Ans.
—	rods 2.4 0 0 0	
12	16 $\frac{1}{2}$	(8)
3	64	272.25) 187.000 (.686868 &c.
15 4	2 — $\frac{1}{2}$	163350 [.68687 near-
dividing $\frac{1}{4}$ by 4	ft. 6.6	[ly Ans.
16	12	236500
Ans. $1\frac{1}{2}$	in. 7.2	217800
		—
		187000
		163350
		—
		236500

(9)	(10)
.8	cubic ft. cubic in.
8	44 86.4
—	1728) 8640 (.05
Ans. 6.4, worth \$ 6.40	8640
	5) 0) 4) 4.05
	—
	Ans. .881

**Lesson 104.**

(1)	(2)
bu. pks.	bu.
14 3	$\frac{2}{3}$
4) 3.0	2
36) 14.75 (.4097 chal. .4097	4
144	8
350	$\frac{2}{3}$ pks.
324	8
Ans. \$ 3.69 nearly	8
	64
260	$\frac{64}{3}$ qts. 3) 64
252	21.333 &c. qts.
—	.04
8	.85333
	Ans. \$ .85, about.



## REDUCTION OF COMPOUND NUMBERS.

(3) hhd.  $\frac{4}{5}$  5) 4.0  
 $\frac{8}{.8}$   
 5 4  
 $\frac{8}{.8}$   
 4 3.2 gals.  
 4  
 1 7 2.8 qts.  
 $\frac{.064}{.064}$   
 1 0.3 68  
 4 3 2  $\frac{1}{4}$   
 Ans. \$ 1 0.8 0 0

(4) qts. pt. 2 1  
 or  $2\frac{1}{2}$  qts.  
 changing to an improper fraction  
 $\frac{2}{2}$   
 $\frac{2}{2}$   
 4  
 1  
 5  
 $\frac{5}{2}$  qts.  
 2  
 dividing by 4  
 $\frac{8}{8}$   
 Ans.  $\frac{5}{8}$  gal.

(5) hhd. gals. 1 2 0  
 63) 200 (.31746  
 $\frac{189}{110}$   
 $\frac{63}{63}$   
 3 hhd. 4 7 0  
 Ans. 3.3 1 7 5 nearly 4 4 1  
 $\frac{290}{252}$   
 $\frac{380}{378}$   
 2

(6) hhd.  $\frac{3}{4}$   
 63  
 3  
 4) 189  
 $\frac{.333}{.333}$   
 3) 47.25  
 Ans. \$ 15.75

(7) h. min. sec. 6 3 4  
 $3\frac{4}{5}$  min.  
 reducing to an improper fraction  
 $\frac{3}{3}$   
 60  
 $\frac{180}{180}$   
 4  
 $\frac{184}{184}$   
 $\frac{184}{184}$  min.  
 60  
 dividing by 60  
 $\frac{3600}{3600}$   
 $6\frac{184}{3600}$  h.  
 reducing to an improper fraction  
 $\frac{3600}{3600}$   
 6  
 $\frac{21600}{21600}$   
 184  
 $\frac{21784}{21784}$  h.  
 $\frac{21784}{3600}$  h.

(8)  $\frac{1}{6}$  d.  
 $\frac{24}{24}$  h.  
 6) 24  
 Ans. 4 h.

(9) 7° 1 2'  
 60) 1 | 2  
 $\frac{.2}{.2}$   
 360) 7.20 (.02 Ans.  
 7.20

(10)  $\frac{1}{9}$  9) 360  
 Ans. 40°

## Lesson 105.

(1)

T. cwt. qr.  
2 3 1

4) 1.0

20) 335 (.1625

20

125

120

50

40

100

100

T.

21625) 250.0000 (115.606

21625 [115.61 nearly

[Ans.

33750

21625

121250

108125

131250

129750

150000

129750

20250

(2)

pwts. grs.

8 8

oz.

5

20

24

8

100

192

24

8

2400

200

2|00) 24|00

Ans. 12

(3)

m. fur. rods

10 2 20

10 4|0) 2|0.0

8

.5

h.

80

3.3

2

60

82.5 fur. 82.5) 198.0 (2 min.

1650

330

60

) 19800 (24 sec.

1650

3300

3300

## REDUCTION OF COMPOUND NUMBERS.

(4)  
sq. m.  
 $1\frac{3}{4}$   
reducing to an improper fraction  
 $\frac{7}{4}$   
 $\frac{640}{360}$   
 $\frac{1000}{840}$   
 $\frac{640}{1000}$   
dividing \$ 1000  
by  $\frac{1000}{840}$  1000)640|000  
Ans. \$ 640

(5)  
T. cubic ft.  
2 12  $\frac{1}{2}$   
5|0) 1|2.5  
2.25  
2.25 T. 2.25) 2 1.00 (9.333 &c.  
2 0 2 5 [or \$9.33  $\frac{1}{3}$   
[Ans.  
750  
675  
750  
675  
75

(6)  
bu. pks.  
4 3  
4) 3.0  
75  
4.75 bu. 4.75) 3 3 2.5 0 (70  
3 3 2 5 [Ans.

(7)  
gals. qts. pt.  
6 2 1  
6 2) 1.0  
4  
5  
24  
2  
26  
26.5 qts. 26.5) 1.590 (.06  
1 5 9 0 [Ans.

(8)  
h. m.  
3 20  
 $\frac{20}{60}$  or  $\frac{2}{3}$  or  $\frac{1}{3}$   
 $3\frac{1}{3}$  h.  
reducing to an improper fraction  
 $\frac{10}{3}$   
 $\frac{3}{3}$   
 $\frac{9}{3}$   
 $\frac{1}{3}$   
 $\frac{10}{3}$   
 $\frac{10}{3}$  h. dividing 10  
by  $\frac{10}{3}$  3  
10)30  
Ans. 3 lea.

(9)  
min.  
20  
20)40( $\frac{1}{2}$  h. dividing 4  
by  $\frac{1}{2}$  3  
Ans. 12 miles.

$$\begin{array}{r}
 (10) \\
 39^{\circ} 45' 12'' \\
 \quad 6|0) 1|2.0 \\
 \quad 6|0) 4|5.2 \\
 \quad \quad \underline{.7533} \text{ \&c.} \\
 39.7533^{\circ} \text{ \&c.} \quad 39.7533) 21.0000 (0 \text{ d.} \\
 \quad \quad \quad 24 \\
 \quad \quad \quad \underline{84} \\
 \quad \quad \quad 42 \\
 \quad \quad ) 504.0000 (12 \text{ h.} \\
 \quad \quad \underline{397533} \\
 \quad \quad 1064670 \\
 \quad \quad \underline{795066} \\
 \quad \quad \underline{269604} \\
 \quad \quad \quad 60 \\
 \quad ) 16176240 (40 \text{ min.} \\
 \quad \underline{1590132} \\
 \quad \quad 274920 \\
 \quad \quad \underline{60} \\
 \quad ) 16495200 (41 \text{ sec.} \\
 \quad \underline{1590132} \\
 \quad \quad 593880 \\
 \quad \quad \underline{397533} \\
 \quad \quad \underline{196347}
 \end{array}$$

Lesson 106.

<p>(1)</p> $  \begin{array}{r}  10000 \text{ T.} \\  1 \\  20 \\  \underline{20} \\  4 \\  \underline{80} \\  28 \\  \underline{64} \\  16 \\  \underline{2240} \text{ lbs. in 1 T.} \\  2240 \text{ lb. } 2240) 5000 (2 \\  \quad \underline{4480} \\  520) 2240 (4 \\  \quad \underline{2080} \\  \quad \quad 160) 520 (3 \\  \quad \quad \underline{480} \\  \quad \quad \quad 40) 160 (4 \\  \quad \quad \quad \underline{160}  \end{array}  $	<p>(2)</p> $  \begin{array}{r}  .0001 \text{ T.} \\  20 \\  \underline{.00020} \\  4 \\  \underline{.008} \\  28 \\  \underline{64} \\  16 \\  \underline{Ans. .224}  \end{array}  $
--	--

- (3)  
lb.  
 $\frac{1}{2}$   
20  
4  

---

80  
28  

---

64  
16  

---

2240  
dividing  $\frac{1}{2}$  by 2240  
2  

---

4480  
Ans.  $\frac{1}{4480}$
- (4)  
in. in.  
 $\frac{1}{2}$  or .5  
12).50(.041666 &c.  
48 [.041667 nearly  

---

20  
12  

---

80  
72  

---

8
- (5)  
ft.  
.01  
12  

---

[Ans. Ans. .12 of an in.]
- (6)  
 $\frac{1}{320}$   
 $\frac{160}{320}$  or  $\frac{1}{2}$  sq. rod  
12  
dividing by  $\frac{1}{2}$  2  

---

Ans. \$ 24
- (7)  
qr.  
4).75  

---

Ans. .1875 of an A.
- (8)  
C.  
.2  
8  

---

Ans. 1.6 ft.
- (9)  
cubic in.  
 $\frac{1}{3}$   
dividing  $\frac{1}{3}$  by 1728  
3  

---

5184  
Ans.  $\frac{1}{5184}$
- (10)  
bu.  
 $\frac{1}{50}$   
4  
8  

---

32  
2  

---

64  
 $\frac{64}{50}$  pt. 50)64(1.28 pt. Ans.  
50  

---

140  
100  

---

400  
400
- (11)  
pk.  
 $\frac{1}{5}$   
5)1.0  

---

4).20  

---

Ans. .05 of a bu.
- (12)  
d.  
 $\frac{1}{2}$   
dividing  $\frac{1}{2}$  by 365  
2  

---

730  
Ans.  $\frac{1}{730}$

## Lesson 107.

[illegible]

(8)

ft. in.	ft.	ft. in.
25 6	4	8 11
25.5 ft.	4 ft.	8.91 $\frac{2}{3}$
25.5		
4		
<hr/>		
102.0	.16	
8.91 $\frac{2}{3}$	8	
<hr/>		
102	128 cubic	128)
918	[ft. in a C.	104.0 (.8125
816		1024 [Ans.
<hr/>		
908.82		
34 — $\frac{1}{3}$		
34 — $\frac{1}{3}$		
<hr/>		
8		
16) 909.50 (56 (7 C.		
80		
<hr/>		
109		
96		
<hr/>		
13.5 cubic feet.		

(9)

ft. in.
3 3
or 3.25 ft.
4
<hr/>
13.00
8
<hr/>
104 cubic ft.
104.0 (.8125
1024 [Ans.
<hr/>
160
128
<hr/>
320
256
<hr/>
640
640

(10)

m.	ft.
1	264
8	
40	
<hr/>	
320	
16 $\frac{1}{2}$	
<hr/>	
192	
32	
<hr/>	
5120	
160 — $\frac{1}{2}$	
<hr/>	
5280 ft. in	5280) 26400 (.05
a m.	26400
	1.05 m.
	long.
multiplying by $\frac{1}{2}$	2) 1.05
	<hr/>
	.525
	640 acres in
	a sq. m.
	<hr/>
	2100
	3150
	<hr/>
	Ans. 336.00

## Lesson 108.

(1)					
cwt.	qrs.	T.	cwt.	qr.	lbs.
3	2	1	2	1	16.8
4		20			
<hr/>					
12		20			
2		2			
<hr/>					
14		22			
28		4			
<hr/>					
112		88			
28		1			
<hr/>					
392		89			
		28			
<hr/>					
		712			
		178			
		16.8			
<hr/>					
392)	2508.8	(6.4 yrs.	365		
	2352		.4		
<hr/>					
	1568		146.0		
	1568		6 yrs. 146 days	Ans.	
<hr/>					

(2)					
T.	cwt.	hhds.	gals.		
2	4	2	17		
<hr/>					
				63	
<hr/>					
20) 4.0				126	
<hr/>				17	
				<hr/>	
				143 gals.	
<hr/>					
2.2 T. 2.2)				143.0 (65 Ans.	
				132	
<hr/>					
				110	
				110	
<hr/>					

(3)				
min.	sec.	h.	min.	sec.
3	15	1	20	36
60		60		
180		60		
15		20		
195		80		
		60		
		4800		
		36		
195)	4836	(24 m.		
	390			
	936			
	780			
	156	or $\frac{156}{195}$ m.		
	8			
1248	(6 fur.			
1170				
	78	or $\frac{78}{195}$ fur.		
	40			
3120	(16 rods.			
195				
1170				
1170				

(4)					
pwts.	grs.	lb.	oz.	pwts.	grs.
2	4	1	5	8	20
24		12			
48		12			
4		5			
52		17			
		20			
		340			
		8			
		348			
		24			
		1392			
		696			
		20			
52)	8372	(161	Ans.		
	52				
	317				
	312				
	52				
	52				



(5)

	A.	qrs.	sq. rods.
	1	3	30
	4		
	<hr/>		
	4		
	3		
	<hr/>		
	7		
	40		
rods. ft. in.	<hr/>		
15 8 3	280		
or 8.25 ft.	30		
	<hr/>		
16.5) 8.25 (.5	15.5 rods.	15.5) 310.0	(20 rods Ans.
825		310	
		<hr/>	
		0	

(6)

ft.	in.	sq. ft.	sq. in.	
3	3	23	108	
or 3.25 ft.				
		144)	108.0 (.75	23.75 sq. feet.
			1008	
			<hr/>	
			720	
			720	

3.25 )	23.75 (	7.3076 ft.
	2275	12
	<hr/>	<hr/>
	1000	6152
	975	3076
	<hr/>	<hr/>
	2500	36912
	2275	3.7 in. nearly.
	<hr/>	
	2250	
	1950	
	<hr/>	
	300	

(7)

ft.	ft.	in.	
8	3	9	
	or 3.75 ft.		
	16		
	8		
3.75			
8			
<hr/>			
30.00	30)	128 (	4.2666 &c. ft.
		120	or $4\frac{2}{3}$
		<hr/>	12
		80	
		60	24
		<hr/>	$8 - \frac{2}{3}$ of 12
		200	
		180	3.2 in.
		<hr/>	
		200	

(8)

4) 27	
<hr/>	6.75 ft.
	12
<hr/>	150
	75
<hr/>	9.00 in.

(9)

ft.	in.		sq. ft.		multiplying	144
2	3				by $\frac{1}{3}$	3) 144
or 2.25 ft.		2.25)	30.00	(13.333 &c.		
			225	or $13\frac{1}{3}$		
		<hr/>	750			48 sq. in.
			675			
		<hr/>	750			
			675			
		<hr/>	750			

(10)

sq. ft.	T.	cubic ft.	
$2\frac{1}{4}$	1	12	
or 2.25 sq. ft.	50		
	50		
	12		
	<hr/>		
2.25)	62.00	(27 $\frac{1}{3}$	ft. reducing $\frac{5}{9}$ of a ft. to in.
	450		12
	<hr/>		5
	1700		
	1575		
	<hr/>		9) 60 (6 $\frac{2}{3}$ in.
			54
			<hr/>
			3) $\frac{6}{3}$ ( $\frac{2}{3}$ )
25)	$12\frac{2}{3}$	( $\frac{1}{3}$ )	

## Lesson 109.

(1)			(2)		
gals. qt.	qts. pt.	qts.	bu. pks. qts.	bu. pk. qts.	bu. pks.
2 1	3 1	2	15 2 5	7 1 3	23 2
4	2	2	4	4	4
—	—	—	—	—	—
8	6	4	60	28	92
1	1		2	1	2
—	—		—	—	—
9	7		62	29	94
2			8	8	8
—			—	—	—
18			496	232	752
18			5	3	
7			—	—	
4			501	235	
—			501		
2)29 — 1 pt.			235		
—			752		
4)14 — 2 qts.			—		
—			8)1488		
3 gals.			—		

4)186 — 2 pks.

46 bu.

(3)		(4)		(5)
h. min.	h. min.	C. ft.	C. ft.	gals. qts. pt.
4 20	2 40	1 7	6 3	2 3 1
60	60	8	8	4
—	—	—	—	—
240	120	8	48	8
20	40	7	3	3
—	—	—	—	—
260	160	15	51	11
260			51	2
160			15	—
—			—	22
60)100(1 h.		8)36 — 4 ft.		1
60		—		—
—		4 C.		23
40 min.				6 days.

2)138

4)69 — 1 qt.

17 gals.

$$\begin{array}{r}
 \text{(6)} \\
 \text{cwt. qrs. lbs.} \\
 18 \quad 3 \quad 20 \\
 4 \\
 \hline
 72 \\
 3 \\
 \hline
 75 \\
 28 \\
 \hline
 600 \\
 150 \\
 20 \\
 \hline
 2120 \\
 3 \quad 4 \quad 20 \\
 28) \overline{6360} (\overline{227} (\overline{56} (2 \text{ T.} \\
 56 \quad 20 \quad 40 \\
 \hline
 76 \quad 27 \quad 16 \text{ cwt.} \\
 56 \quad 24 \\
 \hline
 200 \quad 3 \text{ qrs.} \\
 196 \\
 \hline
 4 \text{ lbs.}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \text{ft. in.} \\
 33 \quad 7 \\
 12 \\
 \hline
 66 \\
 33 \\
 7 \\
 \hline
 403 \\
 4 \\
 \hline
 12)1612(134 \text{ ft.} \\
 12 \\
 \hline
 41 \\
 36 \\
 \hline
 52 \\
 48 \\
 \hline
 4 \text{ in.}
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 \text{lbs. oz.} \\
 15 \quad 9 \\
 16 \\
 \hline
 90 \\
 15 \\
 9 \\
 16 \\
 \hline
 6)249 (\overline{41} (2 \text{ lbs.} \\
 24 \quad 32 \\
 \hline
 9 \quad 9 \text{ oz.} \\
 6 \\
 \hline
 3 \\
 16 \text{ dr. in an oz.} \\
 \hline
 48 (8 \text{ dr.} \\
 48
 \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 \text{hhd. bl. gals.} \\
 1 \quad 1 \quad 16 \\
 2 \\
 \hline
 2 \\
 1 \\
 \hline
 3 \\
 3 \quad 1 \quad \frac{1}{2} \\
 93 \\
 1.5 - \frac{1}{2} \text{ of } 3 \\
 16 \\
 5) \overline{110.5} (22 \text{ gals.} \\
 10 \\
 \hline
 10 \\
 10 \\
 \hline
 .5 \\
 4 \text{ qts. in a gal.} \\
 2.0 \\
 2 \text{ pts. in a qt.} \\
 4 \\
 4 \text{ gi. in a pt.} \\
 5) \overline{16} (3.2 \text{ gi.} \\
 15 \\
 \hline
 10 \\
 10
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 \text{sq. ft. sq. in.} \\
 186 \quad 66 \\
 144 \\
 \hline
 744 \\
 744 \\
 186 \\
 66 \\
 \hline
 26850 \\
 3 \\
 \hline
 144)80550(559.375 \text{ Ans.} \\
 720 \\
 \hline
 855 \\
 720 \\
 \hline
 1350 \\
 1296 \\
 \hline
 540 \\
 432 \\
 \hline
 1080 \\
 1008 \\
 \hline
 720 \\
 720
 \end{array}$$

## ADDITION OF COMPOUND NUMBERS.

## Lesson 110.

$$\begin{array}{r}
 \text{(7)} \\
 \begin{array}{r}
 \text{lb.} \quad \text{qrs.} \quad \text{p.} \quad \text{grs.} \\
 5 \quad 11 \quad 5 \quad 2 \quad 16 \\
 \quad \quad 2 \quad 1 \quad 16 \\
 27 \quad 0 \quad 0 \quad 0 \quad 18 \\
 \hline
 \end{array}
 \end{array}$$

Ans. 33 0 0 2 10

$$\begin{array}{r}
 \text{(8)} \\
 \begin{array}{r}
 \text{chal.} \quad \text{bu.} \quad \text{pks.} \\
 4 \quad 16 \quad 3 \\
 12 \quad 0 \quad 3 \\
 2 \quad 3 \quad 1 \\
 6 \quad 18 \quad 1 \\
 \hline
 \end{array}
 \end{array}$$

Ans. 25 3 0

$$\begin{array}{r}
 \text{(9)} \\
 \begin{array}{r}
 \text{m.} \quad \text{fur.} \quad \text{rods.} \quad \text{ft.} \\
 2 \quad 0 \quad 27 \quad 0 \\
 1 \quad 0 \quad 18 \quad 3 \\
 \quad \quad 36 \quad 10 \\
 \quad \quad \quad 5 \\
 \hline
 \end{array}
 \end{array}$$

Ans. 3 2 2 1½

$$\begin{array}{r}
 \text{(10)} \\
 \begin{array}{r}
 \text{T. cwt.} \quad \text{qrs.} \quad \text{lbs.} \\
 1 \quad \quad \quad \quad \quad \quad \\
 \quad 16 \quad 2 \quad 18 \\
 1 \quad 2 \quad 0 \quad 10 \\
 \quad 18 \\
 \hline
 \end{array}
 \end{array}$$

Ans. 3 16 3 0

$$\begin{array}{r}
 \text{(11)} \\
 \begin{array}{r}
 \text{bu.} \quad \text{pks.} \quad \text{qts.} \quad \text{pt.} \\
 12 \quad 3 \quad 5 \\
 2 \quad 2 \quad 2 \quad 1 \\
 3 \quad 0 \quad 7 \\
 \quad \quad 6 \\
 \quad \quad 1 \quad 4 \\
 \hline
 \end{array}
 \end{array}$$

Ans. 19 1 0 1

$$\begin{array}{r}
 \text{(12)} \\
 \begin{array}{r}
 \text{lbs.} \quad \text{oz.} \quad \text{pwts.} \quad \text{grs.} \\
 5 \quad 11 \quad 7 \quad 3 \\
 6 \quad \quad \quad \quad \\
 2 \quad \quad \quad 15 \\
 \quad \quad \quad 20 \\
 \hline
 \end{array}
 \end{array}$$

Ans. 13 11 8 14

## Lesson 111.

(2)

$$\begin{array}{r}
 \text{(1)} \\
 \begin{array}{r}
 \text{hhds.} \quad \text{bls.} \quad \text{fir.} \quad \text{gals.} \\
 2 \quad 1 \quad \quad \quad \\
 1 \quad 2 \quad 0 \quad 6 \\
 \quad 1 \quad 0 \quad 3 \\
 \hline
 \end{array}
 \end{array}$$

Ans. 5 1 1 0

$$\begin{array}{r}
 \text{lea.} \quad \text{fath.} \\
 25 \quad 2520 \\
 13 \quad 180 \\
 17 \quad 1820 \\
 3 \quad 2260 \\
 \hline
 \end{array}$$

Ans. 60 1,500

$$\begin{array}{r}
 8 \\
 40 \\
 \hline
 320 \\
 16\frac{1}{2} \\
 \hline
 192 \\
 32 \\
 16 - \frac{1}{2} \\
 \hline
 5280 \text{ ft. in a mile.} \\
 3 \\
 6 \overline{)15840}
 \end{array}$$

$$\begin{array}{r}
 2640 \overline{)6780(2} \\
 5280 \\
 \hline
 1500
 \end{array}$$

(4)

$$\begin{array}{r}
 \text{(3)} \\
 \begin{array}{r}
 \text{A.} \quad \text{qrs.} \quad \text{sq. rods.} \\
 17 \quad 3 \quad 12 \\
 25 \quad \quad \quad \\
 4 \quad 0 \quad 6 \\
 \quad \quad 25 \\
 \hline
 \end{array}
 \end{array}$$

Ans. 47 0 3

$$\begin{array}{r}
 \text{C.} \quad \text{ft.} \\
 2 \quad 4 \\
 3 \quad 5\frac{1}{2} \\
 1 \quad 12 \\
 \quad 10 \\
 \quad 13 \\
 \hline
 \end{array}$$

Ans. 11 4½

$$\begin{array}{r}
 8 \\
 2 \\
 3 \overline{)16} \\
 5\frac{1}{3}
 \end{array}$$

# ADDITION OF COMPOUND NUMBERS.

63

(5)				(6)			(7)		
hhds.	bls.	gals.	qts.	yrs.	d.	h.	°	′	″
4	0	24		24	55	17	12	04	13
2	2	4	3	2	4	6	5	12	55
24					5	2		02	07
<hr/>				<hr/>			<hr/>		
Ans. 30	2	28	3	Ans. 26	65	1	Ans. 17	19	15

(8)							
8							
8							
64							
45							
320							
256	1728						
288	288						
	13824						
	13824						
	3456						
21504	4976640	bu.		2314285	bu.	pks.	qts. pt.
	43008			4	231	1	5 1
	67584				17	4	6
	64512			1.7140 pks.	Ans. 249	2	3 1
	30720			8			
	21504			5.712 qts.			
	92160			2			
	86016			1.424 pts.			
	61440						
	43008						
	184320						
	172032						
	122880						
	107520						
	15360						

(9)			(10)		
yds.	ft.	in.			
2	2	7	27		
24			17		
7	1	6	189		
3	1	11	27 4		
<hr/>			40)459(11(2 A.	A.	qrs. sq. rods.
Ans. 38	0	0	40	120	3 21
			59	2	3 19
			40	Ans. 123	3 0
			19		
			sq. rods.		

## SUBTRACTION OF COMPOUND NUMBERS.

## Lesson 112.

(7)				(8)				
T.	cwt.	qrs.	lbs.	lb	$\frac{3}{4}$	$\frac{3}{8}$	$\frac{1}{16}$	grs.
4	13	2	19	3	10	4	1	12
2	17	3	20	1	0	0	1	15
<hr/>				<hr/>				
Ans. 1	15	2	27	Ans. 2	10	3	2	17

(9)			(10)		
hrs.	min.	sec.	bu.	pks.	qts.
17	21	12	215	0	0
10	17	5	38	3	4
<hr/>			<hr/>		
Ans. 7	4	7	Ans. 176	0	4

(11)			(12)			
bls.	gals.	qts.	lbs.	oz.	pwts.	grs.
4	8	2	9	11	17	21
1	7	3	7	10	15	17
<hr/>			<hr/>			
Ans. 3	0	3	Ans. 2	1	2	04

## Lesson 113.

(1)				(2)			
20					640		
2					3		
<hr/>				<hr/>			
3)40(13 cwt.	cwt.	qrs.	lbs.	A.	1920	qrs.	sq. rods.
3	13	1	$9\frac{1}{3}$		712	2	35
		3	17	<hr/>			
10	<hr/>			Ans.	1,207	1	5
9	Ans. 12	1	$20\frac{1}{3}$				
<hr/>							
1							
4							
<hr/>							
)4(1 qr.				(3)			
3		m.	fur.		rods.		
		98	5		3		
1		12	6		4		
28		<hr/>					
	Ans. 85	6	39				
<hr/>							
)28( $9\frac{1}{3}$ lbs.							
27							
<hr/>							
$\frac{1}{3}$							

(4)

	T.	cubic ft.	cubic in.
	7	12	
		30	1200
Ans.	6	31	528

(5)

	bu.	pks.	qts.	pts.
	2	0	0	0
				1
Ans.	1	3	7	1

(6)

	T.	cubic ft.	cubic in.
	3	0	0
			10
Ans.	2	39	1,718

(7)

	yds.	ft.	in.
	3	0	0
			2
Ans.	2	2	10

(8)

	gals.	qts.	pts.	gi.
	17	0	0	2
			1	
Ans.	16	3	1	2

(9)

	lb.	oz.	pwts.	grs.
	1	0	0	0
				4
Ans.		11	19	20

(10)

	w.	d.	h.	min.	sec.
	2	0	0	0	10
		1			
Ans.	1	6	0	0	10

(11)

	tier.	bls.	gals.
	2	2	12
	42	31½	
	84	63	

84

63

12

159

100

Ans. 59

(12)

	w.	d.	h.	min.	sec.
	7	3	16	5	28
	1	4	17	16	39
Ans.	5	5	22	48	49

(13)

	o	'	"
	89	36	0
	71	18	45
Ans.	18	17	15



(14)

bls.	gals.	qts.	pt.
185	23	2	1
123	5	0	1
Ans. 62    18    2    0			

gals.
31.5
3
4)94.5
23.625
4
2.500
2
1.0

pts.

(15)

lbs.	oz.	pwts.	grs.
2	4	0	15
1	0	17	0
Ans. 1    3    3    15			

## MULTIPLICATION OF COMPOUND NUMBERS.

## Lesson 114.

(6)

chal.	bu.	pks.
4	17	2
		8
Ans. 35    32    0		

(7)

°	'
2	15
	90
Ans. 202°    30'	

(8)

T.	cwt.	qrs.	lbs.	oz.
	4	0	27	5
				12
Ans. 2    10    3    19    12				

(9)

lb.	oz.	pwts.	grs.
1	0	0	17
			28
Ans. 28    0    19    20			

(10)

lb	3	3	0	grs.
2	7	2	0	17
				5
Ans. 13    0    3    1    5				

17
28
136
34
24)476(19
24
236
216
20

grs.

(11)

	m.	rods.	
	2	275	275
		37	37
Ans. 105	225		
		8	1925
		40	825
	rods in a m. 320	320	10175 (31 m.
			960
			575
			320
			255 rods.
			2
			37
			14
			6
		Add 31 m.	
			105

(12)

A.	sq. rods.	sq. ft.	
1	4	120	120
		6	6
Ans. 6	26	175½	272.25) 720.00 (2
			54450
			175.50

(13)

C.	ft.	cubic ft.	cubic in.
5	5	0	178
			2
Ans. 11	2	0	356

(14)

hhd.	kil.	fir.
2	1	1
		3
Ans. 7	1	1

(15)

gals.	qts.	pt.	gi.
	5	1	2
			125
Ans. 179	2	1	2

(16)

w.	d.	h.	min.	sec.
	1	18	0	10
				5
Ans. 1	1	18	0	50

## DIVISION OF COMPOUND NUMBERS.

## Lesson 115.

<p>(7)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: right;">lbs.</td> <td style="text-align: right;">oz.</td> <td style="text-align: right;">pwt.</td> <td style="text-align: right;">grs.</td> </tr> <tr> <td style="text-align: right;">6)5</td> <td style="text-align: right;">11</td> <td style="text-align: right;">0</td> <td style="text-align: right;">12</td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td style="text-align: right;">Ans.</td> <td style="text-align: right;">11</td> <td style="text-align: right;">16</td> <td style="text-align: right;">18</td> </tr> </table> <p>(9)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: right;">T.</td> <td style="text-align: right;">cwt.</td> <td style="text-align: right;">qrs.</td> </tr> <tr> <td style="text-align: right;">25) 1</td> <td style="text-align: right;">5</td> <td style="text-align: right;">2 (0 T.</td> </tr> <tr> <td style="text-align: right;">20</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">20</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">5</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">) 25 (1 cwt.</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">25</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">) 2 qrs. (0 qr.</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">28</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">56 (2 <math>\frac{6}{5}</math> lbs.</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">50</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><math>\frac{6}{5}</math></td> <td></td> <td></td> </tr> </table> <p>(11)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: right;">A.</td> <td></td> </tr> <tr> <td style="text-align: right;">15) 17 <math>\frac{2}{3}</math> (1 A.</td> <td></td> </tr> <tr> <td style="text-align: right;">15</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">2 <math>\frac{2}{3}</math></td> <td style="text-align: right;">40</td> </tr> <tr> <td style="text-align: right;">4</td> <td style="text-align: right;">2</td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">) 10 <math>\frac{2}{3}</math> (0 qrs.</td> <td style="text-align: right;">3) 80</td> </tr> <tr> <td style="text-align: right;">40</td> <td style="text-align: right;"><hr/></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td style="text-align: right;">26.666 &amp;c.</td> </tr> <tr> <td style="text-align: right;">400</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">26.666 &amp;c. <math>\frac{2}{3}</math> of 40</td> <td></td> </tr> <tr> <td style="text-align: right;">) 426.666 (28.444 &amp;c. sq. rods.</td> <td></td> </tr> <tr> <td style="text-align: right;">30</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">126</td> <td></td> </tr> <tr> <td style="text-align: right;">120</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">66</td> <td></td> </tr> <tr> <td style="text-align: right;">60</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">66</td> <td></td> </tr> <tr> <td style="text-align: right;">60</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">66</td> <td></td> </tr> <tr> <td style="text-align: right;">60</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">6</td> <td></td> </tr> </table>	lbs.	oz.	pwt.	grs.	6)5	11	0	12	<hr/>				Ans.	11	16	18	T.	cwt.	qrs.	25) 1	5	2 (0 T.	20			<hr/>			20			5			<hr/>			) 25 (1 cwt.			25			<hr/>			) 2 qrs. (0 qr.			28			<hr/>			56 (2 $\frac{6}{5}$ lbs.			50			<hr/>			$\frac{6}{5}$			A.		15) 17 $\frac{2}{3}$ (1 A.		15		<hr/>		2 $\frac{2}{3}$	40	4	2	<hr/>		) 10 $\frac{2}{3}$ (0 qrs.	3) 80	40	<hr/>	<hr/>	26.666 &c.	400		<hr/>		26.666 &c. $\frac{2}{3}$ of 40		) 426.666 (28.444 &c. sq. rods.		30		<hr/>		126		120		<hr/>		66		60		<hr/>		66		60		<hr/>		66		60		<hr/>		6		<p>(8)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: right;"><math>\frac{3}{3}</math></td> <td style="text-align: right;"><math>\frac{3}{6}</math></td> <td style="text-align: right;"><math>\frac{9}{1}</math></td> <td style="text-align: right;">grs.</td> </tr> <tr> <td style="text-align: right;">3)7</td> <td style="text-align: right;">6</td> <td style="text-align: right;">1</td> <td></td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td style="text-align: right;">Ans.</td> <td style="text-align: right;">2</td> <td style="text-align: right;">4</td> <td style="text-align: right;">2 <math>6\frac{2}{3}</math></td> </tr> </table> <p>(10)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: right;">m.</td> <td style="text-align: right;">r.</td> </tr> <tr> <td style="text-align: right;">4</td> <td style="text-align: right;">55</td> </tr> <tr> <td colspan="2" style="text-align: center;">320 rods in a m.</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td style="text-align: right;">1280</td> <td></td> </tr> <tr> <td style="text-align: right;">55</td> <td></td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td style="text-align: right;">12)1335 (111 <math>\frac{1}{4}</math> Ans.</td> <td></td> </tr> <tr> <td style="text-align: right;">12</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">13</td> <td></td> </tr> <tr> <td style="text-align: right;">12</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;">15</td> <td></td> </tr> <tr> <td style="text-align: right;">12</td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> </tr> <tr> <td style="text-align: right;"><math>\frac{3}{12}</math> or <math>\frac{1}{4}</math></td> <td></td> </tr> </table> <p>(12)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: right;">C.</td> <td style="text-align: right;">ft.</td> <td style="text-align: right;">cubic ft.</td> </tr> <tr> <td style="text-align: right;">60)11</td> <td style="text-align: right;">5</td> <td style="text-align: right;">10 (0 C.</td> </tr> <tr> <td style="text-align: right;">8</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">88</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">5</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">)93 (1 ft.</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">60</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">33</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">16</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">198</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">33</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">10</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">)538 (8.9 <math>\frac{2}{3}</math> cubic ft.</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">480</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">580</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">540</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><hr/></td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><math>\frac{48}{60}</math> or <math>\frac{2}{3}</math></td> <td></td> <td></td> </tr> </table>	$\frac{3}{3}$	$\frac{3}{6}$	$\frac{9}{1}$	grs.	3)7	6	1		<hr/>				Ans.	2	4	2 $6\frac{2}{3}$	m.	r.	4	55	320 rods in a m.		<hr/>		1280		55		<hr/>		12)1335 (111 $\frac{1}{4}$ Ans.		12		<hr/>		13		12		<hr/>		15		12		<hr/>		$\frac{3}{12}$ or $\frac{1}{4}$		C.	ft.	cubic ft.	60)11	5	10 (0 C.	8			<hr/>			88			5			<hr/>			)93 (1 ft.			60			<hr/>			33			16			<hr/>			198			33			<hr/>			10			)538 (8.9 $\frac{2}{3}$ cubic ft.			480			<hr/>			580			540			<hr/>			$\frac{48}{60}$ or $\frac{2}{3}$		
lbs.	oz.	pwt.	grs.																																																																																																																																																																																																																																																					
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(13)	(14)	(15)	(16)
chal. bu. pks.	fir.	p.	
7)4 0 • 3(0 chal.	50)2(0 fir.	50)5(0 pipes	27)14(0°
36	9	2	60
—	—	—	—
24	)18(0 gal.	)10(0 hhds.	)840(31'
12	4	63	81
—	—	—	—
)144(20 bu.	)72(1 qt.	)630(12 gals.	
14	50	50	30
—	—	—	—
4	22	130	27
4	2	100	—
—	—	—	—
16	)44(0 pt.	30	3
3	4	4	60
—	—	—	—
)19(2½ pks.	)176(3½ gi.	)120(2 qts.	)180(6¾"
14	150	100	162
—	—	—	—
5	28	20	9)17(¾
		2	
		)40(0 pts.	
		4	
		160(3½ gi.	
		150	
		10 or ½	

## MULTIPLICATION AND DIVISION OF COMPOUND NUMBERS

BY

FRACTIONS AND MIXED NUMBERS.

### Lesson 116.

(1)	(2)
T. cwt. qrs. lbs.	\$ 8½
1 0 2 19	4
	32
	3
3)2 1 1 10	35
	¾
Ans. 13 3 3½	chal. bu. pks.
	1 7 3
	4
	35)4 31 0(0 chal.
	36
	24
	12
	31
	)175(5 bu. Ans.
	175

(3)
lbs. oz. pwts. grs.
8)6 2 0 10
Ans. 9 5 1½

70 MULTIPLICATION AND DIVISION OF COMPOUND NUMBERS.

(4)

$$\begin{array}{r}
 4\frac{1}{3} \\
 3 \\
 \hline
 12 \\
 1 \\
 \hline
 13 \quad \text{lb} \quad \frac{3}{10} \quad \frac{3}{2} \quad \text{D} \\
 13 \\
 \hline
 3 \overline{)11 \quad 1 \quad 2} \\
 \hline
 \text{Ans. } 3 \quad 8 \quad 3 \quad 1
 \end{array}$$

(5)

$$\begin{array}{r}
 \text{sq. rods.} \quad \text{sq. ft.} \\
 .6 \overline{)10 \quad 2.25} \quad 272.25 \\
 \hline
 \text{Ans. } 16 \quad 185.25 \quad .4 \\
 \hline
 108.900 \\
 2.25 \\
 \hline
 .6 \overline{)111.15} \\
 \hline
 185.25
 \end{array}$$

(6)

$$\begin{array}{r}
 \$ 24\frac{3}{4} \\
 4 \\
 \hline
 96 \\
 3 \\
 \hline
 99 \quad \text{C. ft.} \\
 99 \quad 4 \quad 9 \\
 99 \quad 4 \\
 \hline
 99 \overline{)20 \quad 4(0 \text{ C.}} \\
 8 \\
 \hline
 160 \\
 4 \\
 \hline
 )164(1 \text{ ft.} \\
 99 \\
 \hline
 65 \\
 16 \\
 \hline
 390 \\
 65 \\
 \hline
 )1040(10\frac{5}{8} \text{ cubic ft.} \\
 99 \\
 \hline
 5\frac{5}{8}
 \end{array}$$

(7)

$$\begin{array}{r}
 \text{bu. pks.} \quad \text{bu. pks. qts.} \\
 18 \quad 3 \quad \$ 12.50 \quad 7 \quad 3 \quad 2 \\
 5 \quad \text{or } \$ 2\frac{1}{2} \quad 2 \\
 \hline
 12 \overline{)93 \quad 3(7 \text{ bu.}} \quad 25 \overline{)15 \quad 2 \quad 4(0 \text{ bu.}} \\
 84 \\
 \hline
 9 \\
 4 \\
 \hline
 36 \\
 3 \\
 \hline
 )39(3 \text{ pks.} \\
 36 \\
 \hline
 3 \\
 8 \\
 \hline
 )24(2 \text{ qts.} \\
 24 \\
 \hline
 100 \\
 100
 \end{array}$$

(8) .

$$\begin{array}{r}
 4\frac{3}{4} \\
 \underline{4} \\
 16 \\
 3 \\
 \underline{19} \quad \text{hhds. bl. gals.} \\
 19 \quad 2 \quad 1 \quad 7 \\
 1\frac{3}{4} \quad \quad \quad 19 \\
 \hline
 4) 49 \quad 1 \quad 7 \\
 \hline
 \text{Ans. } 12 \quad 0 \quad 25.375
 \end{array}$$

$$\begin{array}{r}
 7 \\
 19 \\
 \hline
 63 \\
 7 \\
 \hline
 31.5) 133.0 \quad (4 \text{ bls. to} \\
 \quad \quad 1260 \quad \quad \text{[carry} \\
 \quad \quad \quad 7.0 \text{ gals.} \\
 \quad \quad \quad 31.5 \\
 \quad \quad \quad 3 \text{ bls.} \\
 \quad \quad \quad \hline
 \quad \quad \quad 94.5 \\
 \quad \quad \quad 7 \\
 \quad \quad \quad \hline
 4) 101.5 \\
 \quad \quad \quad \hline
 \quad \quad \quad 25.375
 \end{array}$$

(10)

$$\begin{array}{r}
 5\frac{1}{2} \\
 2 \\
 \hline
 10 \\
 1 \\
 \hline
 11 \quad 11 \quad 34 \quad 06 \\
 1\frac{1}{2} \quad \quad \quad 2 \\
 \hline
 11) 23 \quad 8 \quad 12(2^{\circ} \\
 \quad \quad 22 \\
 \quad \quad \hline
 \quad \quad 1 \\
 \quad \quad 60 \\
 \quad \quad \hline
 \quad \quad 60 \\
 \quad \quad 8 \\
 \quad \quad \hline
 \quad \quad 68(6' \\
 \quad \quad 66 \\
 \quad \quad \hline
 \quad \quad 2 \\
 \quad \quad 60 \\
 \quad \quad \hline
 \quad \quad 120 \\
 \quad \quad 12 \\
 \quad \quad \hline
 \quad \quad 132(12'' \\
 \quad \quad 11 \\
 \quad \quad \hline
 \quad \quad 22 \\
 \quad \quad 22
 \end{array}$$

(9)

$$\begin{array}{r}
 \text{h.} \quad \text{min.} \quad \text{sec.} \\
 8 \quad 45 \\
 \quad \quad 5 \\
 \hline
 6) 43 \quad 45 \\
 \hline
 \text{Ans. } 7 \quad 17 \quad 30
 \end{array}$$

PROMISCUOUS QUESTIONS

IN

FEDERAL MONEY AND COMPOUND NUMBERS.

Lesson 118.

(1)

$$\begin{array}{r}
 \text{T.} \\
 2 \\
 20 \\
 \hline
 25) 40(1.6 \quad 1.6) .90(.56\frac{1}{2} \text{ Ans.} \\
 \quad \quad 25 \\
 \hline
 \quad \quad 150 \\
 \quad \quad 150 \\
 \hline
 \quad \quad \quad 100 \\
 \quad \quad \quad 96 \\
 \hline
 \quad \quad \quad \frac{4}{16} \text{ or } \frac{1}{4}
 \end{array}$$

(2)

$$\begin{array}{r}
 12\frac{1}{2} \\
 6 \\
 \hline
 72 \\
 3 - \frac{1}{2} \\
 \hline
 \text{Ans. } 75 \text{ cts.}
 \end{array}$$

(3)

$$\begin{array}{r}
 \text{A.} \quad \text{qrs.} \quad \text{sq.} \quad \text{rods} \\
 115 \quad 2 \quad 13 \\
 37 \quad 0 \quad 30 \\
 18 \quad 3 \\
 \hline
 \text{Ans. } 171 \quad 2 \quad 3
 \end{array}$$

(4)  
bu. pk.  
2 1  
4  
—  
8  
1  
—  
9 9)5.94  
Ans. \$.66

(5)  
112  
.04  
—  
4.48  
4.48  
40.  
7.35  
—  
Ans. \$5 1.83

196  
.03  $\frac{3}{4}$   
—  
588  
49 —  $\frac{1}{4}$  of 196  
98 —  $\frac{1}{4}$  of 196  
—  
7.35

(6)  
1  
63  
—  
63  
4  
—  
252  
2  
—  
504)  $\frac{504}{1008}$  ( $\frac{1}{2}$  Ans.

(7)  
yrs. d.  
19 86  
17 119  
—  
Ans. 1 332

(8)  
365  
86  
—  
451  
119  
—  
332  
6)180  
—  
Ans. \$30

(9)  
A. qrs. sq. rods.  
1 2 8  
4  
—  
4  
2  
—  
6  
40  
—  
240  
8  
—  
248  
272  $\frac{1}{4}$   
—  
496  
1736  
496  
—  
67456  
62 —  $\frac{1}{4}$   
—  
67518  
.08  
—  
Ans. \$5,401.44

(10)  
16)  $\frac{48}{128}$  ( $\frac{3}{8}$  Ans.  
48)128(2  
96  
—  
32)48(1  
32  
—  
16)32(2  
32

**Lesson 119.**

**(1)**

$$\begin{array}{r}
 6530 \\
 \underline{6} \\
 16.5) 39180.0 \quad (2374 \text{ (7 m.} \\
 \underline{330} \quad \underline{2240} \\
 618 \quad 134 \text{ rods.} \\
 \underline{495} \\
 1230 \\
 \underline{115.5} \\
 750 \\
 \underline{660} \\
 15) \frac{90}{165} \left( \frac{6}{11} \text{ rod.}
 \end{array}$$

**(3)**

T. cwt. qrs.  
 $\begin{array}{r} 2 \quad 7 \quad 3 \end{array}$

4) 3.0

2|0)|7.75

T. 23875

$\begin{array}{r} 17 \\ \hline 167125 \\ 23875 \end{array}$

Ans. \$40.5875  
 or \$40.58 $\frac{3}{4}$

**(4)**

rods.	ft.	in.	rods.	ft.
5	12	6	2	8
16.5			16.5	
<u>82.5</u>			<u>33.0</u>	
12.5 ft.			8	
<u>95.0</u>			<u>41.0</u>	
95				
41				
<u>95</u>				
380				
Ans. 3895 sq. ft.				

**(2)**

h. min. sec.	gals. qts. pt. gi.
9 4 30	2) 27 3 1
<u>60</u>	<u>13 3 1 2</u>
540	4
<u>4</u>	<u>52</u>
544 $\frac{1}{2}$ min.	3 qts.
<u>1088</u> min.	<u>55</u>
	2
	<u>110</u>
	1 pt.
	<u>111</u>
	4
	<u>444</u>
	2 gi.
	<u>446</u> gi.
	1089
	<u>4014</u>
	3568
	<u>446</u>
	4) 485694 - 2 gi.
	<u>2) 121423 - 1 pt.</u>
	4) 60711 - 3 qts.
	<u>15,177</u> gals.
	<b>(5)</b>
	24
	<u>8</u>
	15) 192 (12 h.
	<u>15</u>
	42
	<u>30</u>
	12
	<u>60</u>
	) 720 (48 min.
	<u>60</u>
	120
	<u>120</u>
	120



## PROMISCUOUS QUESTIONS.

(6)

oz.	pwt.	grs.
6)2	9	12(0 oz.
20		
40		
9		
)49	(8 pwt.	
48		
1		
24		
24		
12		
)36	(6 grs.	
36		

(7)

T.	cwt.	qrs.
2	3	2
		4) 2.0
		2 0)3.5
T. 2.175		

$$\begin{array}{r}
 130.500 \\
 130.500 \\
 \hline
 0
 \end{array}$$

\$ 60 [Ans.

(8)

lb.	oz.	cwt.	qr.	lbs.
1	4	2	1	8
16		4		
16		8		
4		1		
20		9		
		28		
		72		
		18		
		8		
		260		
		16		
		156		
		26		
		2 0)416 0		

Ans. 208 pieces.

(9)

3½		
2		
6		
1		
7	lbs.	oz.
½	56	13
		7
	2)397	11
Ans. 198		13½

(10)

ft.	in.
2	6
or 2.5 ft.	
4	
1 0.0) 12.5	
1.25 ft.	
or 1 ft. 3 in. Ans.	

# PERCENTAGE.

## Lesson 121.

<p>(2)</p> $\begin{array}{r} 950 \\ .08\frac{1}{2} \\ \hline 7600 \\ 475 \\ \hline \text{Ans. } \$80.75 \end{array}$	<p>(3)</p> $\begin{array}{r} 2507.75 \\ .20 \\ \hline \text{Ans. } \$501.5500 \end{array}$	<p>(4)</p> $\begin{array}{r} 4.35 \\ 1000 \\ \hline \text{Ans. } \$4,350.00 \end{array}$																																																																																																						
<p>(5)</p> <table border="0"> <thead> <tr> <th>cwt.</th> <th>qrs.</th> <th>lbs.</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>1</td> <td>27</td> </tr> <tr> <td>5</td> <td>0</td> <td>7</td> </tr> <tr> <td>3</td> <td>3</td> <td>8</td> </tr> <tr> <td><hr/></td> <td><hr/></td> <td><hr/></td> </tr> <tr> <td>13</td> <td>1</td> <td>14</td> </tr> <tr> <td>4</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>52</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>53</td> <td></td> <td></td> </tr> <tr> <td>28</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>424</td> <td></td> <td></td> </tr> <tr> <td>106</td> <td></td> <td></td> </tr> <tr> <td>14</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>1498</td> <td></td> <td></td> </tr> <tr> <td>.18</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>11984</td> <td></td> <td></td> </tr> <tr> <td>1498</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>28)269.64</td> <td>4</td> <td></td> </tr> <tr> <td>252</td> <td>8</td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>lbs. 17.64</td> <td>1 qr.</td> <td></td> </tr> <tr> <td>16</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>384</td> <td></td> <td></td> </tr> <tr> <td>64</td> <td></td> <td></td> </tr> <tr> <td><hr/></td> <td></td> <td></td> </tr> <tr> <td>oz. 10.24</td> <td></td> <td></td> </tr> </tbody> </table>	cwt.	qrs.	lbs.	4	1	27	5	0	7	3	3	8	<hr/>	<hr/>	<hr/>	13	1	14	4			<hr/>			52			1			<hr/>			53			28			<hr/>			424			106			14			<hr/>			1498			.18			<hr/>			11984			1498			<hr/>			28)269.64	4		252	8		<hr/>			lbs. 17.64	1 qr.		16			<hr/>			384			64			<hr/>			oz. 10.24			<p>(6)</p> $\begin{array}{r} 4000)20000 \\ 20000 \\ \hline \text{Ans. } \$2,500 \end{array}$	<p>(7)</p> $\begin{array}{r} .10)250.00 \\ \hline \text{Ans. } \$2,500 \end{array}$
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COMMISSION.

$$\begin{array}{r} 1992 \\ \underline{8} \end{array}$$

$$\begin{array}{r} 2000) 8.000 (.004 \\ \underline{8000} \text{ or } \frac{4}{100} \\ \text{[per cent.]} \end{array}$$

$$\begin{array}{r} 1.00 \\ \underline{.05} \\ 114.00 \\ \underline{95} \\ 190 \\ \underline{190} \\ 0 \end{array}$$

$$\begin{array}{r} 1.00 \\ \underline{.20} \\ 1.20) 75.00 \text{ yds.} \\ \underline{720} \text{ [Ans.]} \\ 300 \\ \underline{240} \\ 60) \frac{30}{120} (\frac{1}{2} \end{array}$$

COMMISSION.

Lesson 122.

$$\begin{array}{r} .02\frac{1}{2} \\ \text{or } .0225 \end{array} \quad \begin{array}{r} 3525.16\frac{2}{3} \\ \underline{.0225} \\ 1762580 \\ 705032 \\ 705032 \\ 75 - \frac{1}{3} \\ 75 - \frac{1}{3} \\ \hline \$79.316250 \\ \text{Ans. } \$79.32 \end{array}$$

(2)

	chal.	bu.	pks.
4) 30	375	35	3
36) 35.75 (.993	375.993		
324	12		
335	751986		
324	375993		
110	4511916		
108	.02		
2	\$90.23832		
	Ans. \$90.24		

(3)  
A. qrs. sq. rods.  
117 2 4

$$\begin{array}{r} 40 \overline{)4.0} \\ 4 \overline{)2.1} \\ \hline \text{A. } 117.525 \\ \phantom{117.}18 \\ \phantom{117.}940200 \\ \phantom{117.}117525 \\ \hline \phantom{117.}2115450 \\ \phantom{117.}\phantom{0}01\frac{1}{2} \\ \hline \phantom{117.}211545 \\ \phantom{117.}70515 \\ \hline \phantom{117.}282060 \end{array}$$

211545  
2821  
Ans. \$2,087.24

$$\begin{array}{r} 100 \quad (6) \\ .03 \quad \$ \\ \hline .97 \overline{)97970} \quad (1010) \\ \phantom{.97}97 \\ \hline \phantom{.97}97 \\ \phantom{.97}97 \\ \hline \phantom{.97}0 \end{array}$$

$$\begin{array}{r} \$ \\ 2525 \overline{)10100} \quad (.40 \text{ Ans.}) \\ \phantom{2525}10100 \end{array}$$

$$\begin{array}{r} 100 \quad (7) \\ .025 \\ \hline 1.025 \overline{)2050.000} \quad (2000) \\ \phantom{1.025}2050 \\ \hline \phantom{1.025}\phantom{000} \$ 50 \text{ Ans.} \end{array}$$

## STOCKS.

## Lesson 123.

$$\begin{array}{r} (1) \\ 1215 \\ \phantom{1215}100 \\ \hline 121500 \\ \phantom{121500}23 \\ \hline \phantom{121500}3645 \\ \phantom{121500}2430 \\ \hline \end{array}$$

Ans. \$2,794.50

$$\begin{array}{r} (2) \\ 1.00 \\ 60 \overline{)540} \quad (.90) \\ \phantom{60}540 \\ \hline \phantom{60}\phantom{0} .10 \text{ Ans.} \end{array}$$

$$\begin{array}{r} (3) \\ 2.70 \\ \phantom{2.70}500 \\ \hline 1350.00 \\ \phantom{1350.00}500 \\ \hline \text{Ans. } \$1850 \end{array}$$

## BANKRUPTCY.

$  \begin{array}{r}  (4) \\  250 \\  \underline{5} \\  1250 \\  101 \\  \hline  125 \\  125 \\  \hline  126250 \\  \text{is } .0075 \quad .0075 \\  \hline  63125 \\  88375 \\  \hline  946875 \text{ commission.} \\  126250 \\  \hline  127196875 \\  \text{Ans. } \$127197  \end{array}  $	$  \begin{array}{r}  (5) \\  1.00 \\  \underline{.40} \\  .60) 300.00 \text{ (50 Ans.} \\  \underline{300} \\  0  \end{array}  $ $  \begin{array}{r}  (6) \\  1.00 \\  \underline{.12} \\  1.12) 560.00 \text{ (500 Ans.} \\  \underline{560} \\  00  \end{array}  $
---	---

## BANKRUPTCY.

$  \begin{array}{r}  (7) \\  3528) 296352 \text{ (.84 Ans.} \\  \underline{28224} \\  14112 \\  14112 \\  \hline  1800 \\  8350 \\  2511.16\frac{2}{3} \\  5000 \\  \hline  17661.16\frac{2}{3}  \end{array}  $	$  \begin{array}{r}  (8) \\  .84 \\  \underline{100} \\  \text{Ans. } \$84.00  \end{array}  $ $  \begin{array}{r}  (9) \\  1800 \\  8350 \\  2511.16\frac{2}{3} \\  5000 \\  \hline  10596.700 \text{ (.60 Ans.} \\  \underline{10596.700} \\  1800 \\  \underline{.60} \\  \text{John Smith } \$1080.00  \end{array}  $	$  \begin{array}{r}  (10) \\  .33\frac{1}{3} \\  \text{is } \frac{1}{3} \text{ 3)180} \\  \hline  \text{Ans. } \$60  \end{array}  $ $  \begin{array}{r}  8350 \\  \underline{.60} \\  \text{Charles Brown } \$5010.00 \\  \hline  5000 \\  \underline{.60} \\  \text{James Thompson } \$3000.00 \\  \hline  15066.960 \\  40 - \frac{2}{3} \text{ of } 60 \\  \hline  \text{John Williams } \$15066.7000  \end{array}  $
---	---	---

(11)

10000  
5000  
3828  
6500

$$\begin{array}{r}
 25328) 165250 \text{ (.652439)} \\
 \underline{151968} \quad [65 \frac{244}{1000} \text{ nearly}] \\
 132820 \\
 \underline{126640} \\
 61800 \\
 \underline{50656} \\
 111440 \\
 \underline{101312} \\
 101280 \\
 \underline{75984} \\
 252960 \\
 \underline{227952} \\
 25008
 \end{array}$$

[Ans.]

$$\begin{array}{r}
 .65244 \\
 \underline{10000} \\
 \text{A. } \$6,524.40000 \\
 .65244 \\
 \underline{5000} \\
 \text{B. } \$3,262.20000 \\
 .65244 \\
 \underline{3828} \\
 521952 \\
 \underline{130488} \\
 521952 \\
 \underline{195732} \\
 \text{C. } \$2,497.54032 \\
 .65244 \\
 \underline{6500} \\
 326220 \\
 \underline{391464} \\
 \text{D. } \$4,240.86000
 \end{array}$$

LOSS AND GAIN.

Lesson 124.

$$\begin{array}{r}
 \text{(1)} \\
 3500 \\
 \underline{.10} \\
 350.00 \\
 \text{Add } 3500 \\
 \hline
 \text{Ans. } \$3,850
 \end{array}$$

$$\begin{array}{r}
 \text{(2)} \\
 27 \\
 \underline{5} \\
 135 \\
 \underline{4} \\
 540 \\
 583.20 \\
 \underline{540} \\
 540) 4320 \text{ (.08 Ans.)} \\
 \underline{4320}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 1.00 \\
 \underline{.18} \\
 .82 \\
 873.25 \\
 \underline{82} \\
 174650 \\
 \underline{698600} \\
 7160650 \\
 \text{Ans. } \$7160.6\frac{1}{2}
 \end{array}$$

(4)	(5)	(6)	
.33½ is ¼	.33½	T. cwt.	1.00
.25 is ¼	.25	35 18	.125
\$			
3)2000 paid.	Ans. .08½	2 0) 1 8	1.125
666⅔		35.9	600
2000		35.9) 675.000	\$
		359	(18.80
4)2666⅔ marked price.			[Ans.
666⅔		3160	
2666⅔		2872	
666⅔		2880	
		2872	
\$ 2000 sold for.			80
(7)		(8)	
750		1.00	1.00
.02		.30	.10
15.00		1.30	1.10
750		25	25
765) 350.0 (.45751		65	55
3060 [45¼ about Ans.		26	22
4400		32.50	27.50
3825		27.50	
5750		Ans. \$5.	
5355		(9)	
3950		1.00	
3825		4	
1250		7 00	
765		1.04) 455.000	(43 75
485		416	\$6.25 Ans.
		390	
		312	
		780	
		728	
		520	
		520	

(10)	(11)
$  \begin{array}{r}  21.50 \quad 65 \\  \underline{65} \quad 30 \\  1075 \quad 1950 \\  1290 \quad 1582.92 \\  \hline  13975 \quad 367.08 \\  5059 \\  7933 \\  39. \\  12. \\  450 \\  \hline  1582.92  \end{array}  $	$  \begin{array}{r}  1.00 \\  \underline{.15} \\  115) 11500.00 \quad 10800 \\  \underline{115} \quad 10000 \text{ cost.} \\  0000 \\  \hline  10000) 8000.00 (.08 \\  80000 \text{ [Ans.}  \end{array}  $
$  \begin{array}{r}  1582.92) 367.080 (.23190 \\  \underline{316584} \quad .23190 \text{ about Ans.} \\  504960 \\  474876 \\  \hline  300840 \\  158292 \\  \hline  1425480 \\  1424628 \\  \hline  8520  \end{array}  $	

## DRAFT AND TARE.

## Lesson 125.

(1)	(2)
$  \begin{array}{r}  20 \quad 12 \\  \underline{2} \quad 20 \\  128 \quad 40 \text{ draft.} \quad 240 \text{ tare.} \\  \underline{20} \quad 40 \\  2560 \quad 240 \\  \underline{280} \quad 280 \\  \hline  2280 \text{ lbs. Ans.}  \end{array}  $	$  \begin{array}{r}  \text{cwt. qrs. lbs.} \\  5 \quad 0 \quad 23 \\  \underline{4 \quad 3} \\  3 \quad 3 \quad 26 \\  \hline  13 \quad 3 \quad 21 \\  \hline  13 \quad 3 \quad 9 \\  \underline{1 \quad 3 \text{ tare.}} \\  \text{Ans. } 13 \quad 2 \quad 6  \end{array}  $
$  \begin{array}{r}  (3) \\  112 \\  \underline{10} \\  1120 \\  \text{Draft } 10 \quad 1110 \\  \hline  .02 \\  1110 \\  \text{Tare } 22 \quad 22.20 \\  \hline  \text{Ans. } 1088 \text{ lbs.}  \end{array}  $	$  \begin{array}{r}  4 \\  4 \\  4 \\  \hline  12 \text{ draft.} \quad \text{cwt. qrs. lbs.} \\  13 \quad 3 \quad 9 \\  \underline{4} \\  52 \\  3 \\  \hline  55 \\  28 \\  \hline  440 \\  110 \\  9 \\  \hline  1549 \\  .02 \\  28) 30.98 (1 \text{ qr.} \\  \underline{28} \\  2.98 \\  \hline  \text{say } 3 \text{ lbs.}  \end{array}  $



## DRAFT AND TARE.

(4)		(5)		
	112	cwt.	7	lbs.
	17		1	6
	<u>784</u>		<u>4</u>	
	112		<u>28</u>	
	<u>1904</u>		1	
Draft	17		<u>29</u>	
			<u>28</u>	
	<u>1887</u>		<u>232</u>	
Tare	38		58	
	4		6	27
28) 1849 (	66 (16 cwt.		<u>4</u>	
	4		<u>818</u>	
	<u>169</u>		27	108
	168		<u>5726</u>	
	<u>1 lb.</u>		<u>1636</u>	21978
	2 qrs.			.12
			<u>22086</u>	
			Draft 108	<u>43956</u>
				21978
			<u>21978</u>	
			Tare 2637	<u>263736</u>
				Ans. 19,341 lbs.

(6)		(7)		(8)	
gals.	qts.	4	217	50	
68	3.	2	4	6	
60					
65	5	Ans. 8 lbs.	868	50) 440	
<u>195</u>	0	[draft.	.08		
.02			<u>6944</u>	.88	Ans.
<u>3.90</u>					
Ans. 4 gals.			Ans. 69 lbs. tare.		

## DUTIES.

## Lesson 126.

(1) 10275 44 <hr/> 41100 41100 <hr/>	(2) 112 18 <hr/> 896 112 <hr/>	(3) 1637 20 <hr/> Ans. \$327.40
Ans. \$4,521.00	Draft 2016 18 <hr/> 1998 1.0 <hr/> Tare 1998 199.80 200 200 <hr/> 1798 .04 <hr/>	
	Ans. \$71.08	
(4) 130 7 <hr/> 910 Leakage 18 <hr/> 892 .15 <hr/> 4460 892 <hr/>	910 .02 <hr/> 18.20	(6) cwt. qrs. lbs. 7 2 6 4 <hr/> 28 2 <hr/> 30 28 <hr/> 840 6 16 846 4 16 64 <hr/> 5076 846 13472 <hr/> 13536 .17 Draft 64 94304 <hr/> 13472 13472 Tare 2290 2290.24 <hr/> 11182 .025 <hr/> 55910 22364 <hr/>
Ans. \$133.80	(5) 8237 .10 <hr/> Ans. \$823.70	Ans. 279.550

## SIMPLE INTEREST.

(7)	(8)	(9)
275	800	112
30	.02	230
Ans. \$ 8,250	800	336
	Leakage 16	224
	784	25760
	.42	.02
	1568	25760
	3136	Leakage 515
Ans. \$ 329.28		515.20
		25245
		.04
		Ans. \$ 1,009.80

## SIMPLE INTEREST.

## Lesson 127.

(2)	(3)	(4)
2750.25	2750.25	1723.33
.05	137.51	.05 $\frac{3}{4}$
<hr/>	<hr/>	<hr/>
137.5125	Ans. 2,887.76	86.1665
Ans. \$ 137.51		4308325 $\frac{1}{4}$
		8616650 $\frac{1}{4}$
		<hr/>
		99.091475
	Ans. \$ 99.09	

(5)	(6)	(7)	(8)
1800	1000	12230	1250
.06	.04 $\frac{1}{2}$	.06	.07
<hr/>	<hr/>	<hr/>	<hr/>
108.00	4000	733.80	87.50
3	125 — $\frac{1}{8}$	5	6
<hr/>	750 — $\frac{3}{8}$	<hr/>	<hr/>
\$ 324		3669.0	\$ 525.0
Ans.]	48.75	12230	[Ans.
	12	<hr/>	
	<hr/>	Ans. \$ 15,899	
	9750		
	4875		
	<hr/>		
Ans. \$ 585.00			

(9)	(10)	(11)
1605.05	250	16.25
.06 $\frac{1}{2}$	.06	.06
<hr/>	<hr/>	<hr/>
963030	15.00	.9750
5350166 &c. — $\frac{1}{3}$	7	2 $\frac{1}{2}$
5350166 &c. — $\frac{1}{3}$	<hr/>	<hr/>
107.0033	\$105	1.9500
6 $\frac{1}{2}$	[Ans.	4875 — $\frac{1}{2}$
<hr/>		<hr/>
6420198		2.4375
535016 — $\frac{1}{2}$		16.25
<hr/>		<hr/>
695.5214		18.6875
1605.05	Ans. \$18.69	
<hr/>		
Ans. \$2,300.57		

**Lesson 128.**

(2)
31
20
<hr/>
11 days in Jan.
12 days in Feb.
<hr/>
23
120
<hr/>
46
23
<hr/>
365 ) 2760 (7.56
2555
<hr/>
2050
1825
<hr/>
2250
2190
<hr/>
600

	(3)		(4)		
	243		1800		21
	1 17		.06		7
116.50	— 4			31	—
.07	244 —		108.00	108	14
	13 13		4	45	45
81550	—				
231	231		432	540	
			1332	432	
8155					
24465			445.32	365)4860	(13.315
16310			1800	865	
365)1883805	\$				
1825	5.16 Ans.		\$2245.32	1210	
			[Ans.	1095	
588				1150	
365				1095	
2230				550	
2190				365	
400				1850	
				1825	
				25	

	(5)
605.25	
.06 $\frac{3}{4}$	
363150	
1513125 — $\frac{1}{4}$	
3026250 — $\frac{1}{4}$	
40.854375 in. for 1 yr.	40.85
2.238	20
43.092	365)817.00
Ans. \$43.09	730
	870
	730
	1400
	1095
	3050
	2920
	130

$$\begin{array}{r}
 1000. \\
 .07 \\
 \hline
 7000 \\
 2 \\
 \hline
 140
 \end{array}
 \quad
 \begin{array}{r}
 70 \\
 10 \\
 \hline
 80
 \end{array}
 \quad
 \begin{array}{r}
 365) 700 (1917 \\
 365 \\
 \hline
 3350 \\
 3285 \\
 \hline
 650 \\
 365 \\
 \hline
 2850 \\
 2555 \\
 \hline
 295
 \end{array}$$

\$141.92 Ans.

$$\begin{array}{r}
 (7) \\
 2800 \\
 .05 \frac{1}{2} \\
 \hline
 14000 \\
 93333 \&c. \frac{1}{2} \\
 93333 \&c. \frac{1}{2} \\
 \hline
 1586666 \&c. \\
 303 \\
 \hline
 4759999 \\
 4759999 \\
 365) 480759899 (131715 \\
 365 \\
 \hline
 1157 \quad 2800 \\
 1095 \quad 13172 \\
 \hline
 625 \quad \text{Ans. } \$2931.72 \\
 365 \\
 \hline
 2609 \\
 2555 \\
 \hline
 548 \\
 365 \\
 \hline
 1839 \\
 1825 \\
 \hline
 14
 \end{array}$$

$$\begin{array}{r}
 7130 \\
 .06 \\
 \hline
 4278 \\
 6 \text{ yrs.} \\
 \hline
 25668 \\
 2719 \\
 \hline
 28387 \\
 \$2839. \\
 \text{Ans.}
 \end{array}
 \quad
 \begin{array}{r}
 (8) \\
 4278 \\
 232 \\
 \hline
 8556 \\
 12834 \\
 \hline
 8556 \\
 365) 992496 (2719 \\
 730 \\
 \hline
 2624 \\
 2555 \\
 \hline
 699 \\
 365 \\
 \hline
 3346 \\
 3285 \\
 \hline
 61
 \end{array}$$

$$\begin{array}{r}
 (9) \\
 18 \\
 7 \\
 \hline
 2500.50 \\
 .10 \\
 \hline
 2500.500 \\
 28 \\
 \hline
 200040 \\
 50010 \\
 \hline
 365) 700140 (1918 \\
 365 \\
 \hline
 3351 \\
 3285 \\
 \hline
 664 \\
 365 \\
 \hline
 2990 \\
 2920 \\
 \hline
 70
 \end{array}$$

[Ans.]

(10)

5000	
.06	211
<u>300.00</u>	<u>300</u>
	365)63300(173.42
	<u>365</u>
	2680
	<u>2555</u>
	1250
	<u>1095</u>
	1550
	<u>1460</u>
	900
	<u>730</u>
	1700

$$\begin{array}{r}
 \text{(11)} \\
 \begin{array}{r}
 800 \\
 .07 \\
 \hline
 56.00 \\
 7 \text{ yrs.} \\
 \hline
 392 \\
 3928 \\
 \hline
 \$431.28 \\
 \text{[Ans.}
 \end{array}
 \end{array}$$

## Lesson 129.

$  \begin{array}{r}  \text{\textbf{(2)}} \\  850.25 \\  \underline{.05} \\  8 \text{ mo. } 425.125 \\  \text{or } \frac{2}{3} \text{ yr. } \quad \quad 2 \\  \hline  3) 850.250 \\  \hline  283.416 \\  \hline  \text{Ans. } \$283.4  \end{array}  $	$  \begin{array}{r}  \text{\textbf{(3)}} \\  75.50 \\  \underline{.08} \\  12) 60.40 \\  \underline{60} \\  40 \\  \underline{36} \\  40 \\  \underline{36} \\  4  \end{array}  $	$  \begin{array}{r}  (.5033 \quad .5033 \\  \underline{4 \text{ mo. } 12 \text{ d.}} \\  2.0132 \\  \underline{201} \\  2.214 \\  \hline  30) 6.0396 \\  \underline{20132}  \end{array}  $
--	---	--

$$\begin{array}{r}
 1738 \\
 .06 \\
 \hline
 10428 \\
 \text{5 yrs.} \\
 \hline
 52140 \\
 2172\frac{1}{2} \\
 \hline
 \text{Ans. } \$543.12\frac{1}{2}
 \end{array}
 \qquad
 \begin{array}{r}
 (4) \\
 12) 10428 \\
 \underline{96} \\
 82 \\
 \underline{72} \\
 108 \\
 \underline{108}
 \end{array}
 \qquad
 \begin{array}{r}
 (8.69 \\
 2\frac{1}{2} \\
 \hline
 1738 \\
 4345 - \frac{1}{2} \\
 \hline
 21725
 \end{array}
 \qquad
 \begin{array}{r}
 31 \\
 22 \\
 \hline
 1 \\
 1 \\
 \hline
 2 \text{ mo. } 15 \text{ d.} \\
 \text{or } 2\frac{1}{2} \text{ mo.}
 \end{array}$$

(5)		(6)	
	31	15 00	
	20	.025	
	<hr/>	<hr/>	
100	11	75	
.02	1	30	
<hr/>	<hr/>	<hr/>	
2.00	2 mo. 15 d.	37.500	375
2½	or 2½ mo.	5 mo.	18
<hr/>		<hr/>	<hr/>
4		187.5	3000
1		22.5	375
<hr/>		1500.	<hr/>
Ans. \$5		Ans. \$1,710.0	30) 675.0
			<hr/>
			22.5

(7)	(8)	(9)
2000	500	30) 70
.06	.01	150
<hr/>	<hr/>	.10
4) 120.00	5.00	12) 15.00 (1.25
<hr/>	2½	12
Ans. \$30	10	30
	1.666 &c. — ⅓	24
	<hr/>	<hr/>
	11.666	60
	500	60
	<hr/>	
	511.666	
	or \$511.66⅔ Ans.	

(10)		
18.25		
.08		
<hr/>		
1.4600	12) 1.46 (	.1216
2 yrs.	12	2.1
<hr/>	<hr/>	<hr/>
2.92	26	1216
.25536	24	2432
<hr/>	<hr/>	<hr/>
3.17536	20	.25536
Ans. \$3.18	12	
	<hr/>	
	80	



## Lesson 130.

(1)

	yr.	mo.	d.
55.20	1	7	12
1.61 $\frac{2}{3}$			
<hr/>			
552			30) 12.0
3312			
552			12) 7.4 (.6166 &c.
<hr/>			
88.872			72 or .61 $\frac{2}{3}$
184 — $\frac{1}{3}$			1.61 $\frac{2}{3}$ yr.
184 — $\frac{1}{3}$			20
<hr/>			
89.240)	5.35000	(.06 nearly Ans.	80
	535440		72
			8

(2)

1 yr. 91 d.

365) 91.0 (.2493	1.2493 yr.	
730	150	
<hr/>		
1800	62465	163.125
1460	12493	150
<hr/>		
3400	187.3950	187.395) 131.2500 (.07
3285		131.1765 [Ans.
<hr/>		
1150		735
1095		
<hr/>		
55		

(3)

2515.3125	2615.375	
.06	2515.3125	
<hr/>		
150.918750	150.91875) 100.062500 (.6630 yr.	663
	90551250	365
<hr/>		
	95112500	3315
	90551250	3978
<hr/>		
	45612500	1989
	45275625	241.995
<hr/>		
	3368750	Ans. 242 d.

(4)

$$\begin{array}{r} 87 \\ .06 \\ \hline \end{array}$$

$$\begin{array}{r} 5.22) 17.50 \text{ (3.3524 yrs. } .3524 \\ 1566 \\ \hline \end{array}$$

(5)

$$\begin{array}{r} \text{yrs. d.} \\ 2 \quad 17 \\ \hline \end{array}$$

$$\begin{array}{r} 365 \\ 2 \\ \hline \end{array}$$

$$\begin{array}{r} 730 \\ 17 \\ \hline \end{array}$$

$$\begin{array}{r} 747 \\ \hline \end{array}$$
Multiply  $\frac{747}{365}$  yrs. by .07
$$\begin{array}{r} 747 \\ .07 \\ \hline \end{array}$$

$$\begin{array}{r} 52.29 \\ 52.29 \\ 365 \\ \hline \end{array}$$

$$\begin{array}{r} \text{Dividing} \\ 37.25 \text{ by } \frac{52.29}{365} \\ 365 \\ \hline \end{array}$$

$$\begin{array}{r} 18625 \\ 22350 \\ 11175 \\ \hline \end{array}$$

$$\begin{array}{r} 52.29) 13596.25 \text{ (260.016} \\ 10458 \quad \$260.02 \text{ Ans.} \\ \hline \end{array}$$

$$\begin{array}{r} 31382 \\ 31374 \\ \hline \end{array}$$

$$\begin{array}{r} 8500 \\ 5229 \\ \hline \end{array}$$

$$\begin{array}{r} 32710 \\ 31374 \\ \hline \end{array}$$

$$\begin{array}{r} 1336 \\ \hline \end{array}$$

## SIMPLE INTEREST.

(7)

$  \begin{array}{r}  1 \\  .05 \\  \hline  .05 \\  1 \frac{10}{100} \\  \hline  .05 \\  .01438 \\  \hline  \$1.06438 \text{ amount of } \$1.  \end{array}  $	$  \begin{array}{r}  1 \frac{10}{100} \text{ yr.} \\  105 \\  .05 \\  \hline  365) 525 (.01438 \\  \underline{365} \\  1600 \\  \underline{1460} \\  1400 \\  \underline{1095} \\  3050 \\  \underline{2920} \\  130  \end{array}  $
--	--

$  \begin{array}{r}  1.06438) 100.00000 \text{ (93.95 Ans.} \\  \underline{957942} \\  420580 \\  \underline{319314} \\  1012660 \\  \underline{957942} \\  547180 \\  \underline{532190} \\  149900  \end{array}  $	$  \begin{array}{r}  1400 \\  \underline{1095} \\  3050 \\  \underline{2920} \\  130  \end{array}  $
--	--

(8)

$  \begin{array}{r}  1 \\  .07 \\  \hline  .07 \\  4 \frac{1}{4} \\  \hline  .28 \\  175 - \frac{1}{4} \\  \hline  12975) 25.125 \text{ (19.364 } \$19.36 \text{ Ans.} \\  \underline{12975} \\  121500 \\  \underline{116775} \\  47250 \\  \underline{38925} \\  83250 \\  \underline{77850} \\  54000 \\  \underline{51900}  \end{array}  $	$  \begin{array}{r}  \text{yrs. mo.} \\  4 \quad 3 \\  \text{or } 4 \frac{3}{4} \text{ yrs.}  \end{array}  $
--	--

(9)

	yr. d.	153	26
	1 174	21	5
$\frac{174}{365}$	or $\frac{174}{365}$ yr.	174	21
$\frac{.06}{365}$		174	
$\frac{.06}{365}$		.06	
$\frac{.0286}{365}$	$\frac{174}{365}$ of .06	365) 10.44	(.0286
1.0886	amount of \$ 1	730	
		3140	
		2920	
		2200	
		2190	
		10	
1.0886	250.0000	(229.65	Ans.
	21772		
	32280		
	21772		
	105080		
	97974		
	71060		
	65316		
	57440		
	54430		
	3010		

(10)

		1	
		.06	
		1.06	
		10.00	(9.433
		954	Ans.
		460	
		424	
		360	
		318	
		420	
		318	
		102	

**Lesson 131.**

(2)

	61	12
	10	2
yr. d.	51	10
2 51	51	10
or $2\frac{51}{365}$ yrs.	183	14
	2	12
yr. d.	185	2
2 185	185	2
or $2\frac{185}{365}$ yrs.	90	14
	13	1
d.	77	13
77	77	13
or $\frac{77}{365}$ yr.		
yr. d.		
2 122		
or $2\frac{122}{365}$ yrs.		

time from 2nd to 3d payment.

time from 3d payment to July 1st, 1825.

(Carried over.)

## SIMPLE INTEREST.

(Brought over.)

5255.50			
.06			
<u>315.330</u>			315.33
2			185
630.66	in. for 2 yrs.; more		157665
	than 1st payment.		252264
			31533
630.66	600		
159.82	1000	365	58336.05 (159.824
			365
790.48	1600		
	790.48		2183
5255.50			1825
809.52	809.52 excess.		
			3586
4445.98	1st rem.		3285
.06			
<u>266.7588</u>			3010
77			2920
18673116			905
18673116			730
	2260.37		1750
365)20540.4276(56.275	56.28		1460
1825			
	2204.09 excess.		290
<u>2290</u>			
2190	4445.98 1st rem.		
	2204.09		
<u>1004</u>			
730	2241.89 2nd rem.	1345134	
	.06		122
<u>2742</u>			
2555	1345134		2690268
	2422 yrs.		2690268
1877			1345134
1825	2690268		
	44.96	365	16410.6348(44.96
			1460
	313.99		
	2241.89		1810
			1460
	\$2555.88 Ans.		3506
			3285
			2213
			2190
			230

(3)

d.  
62or  $\frac{62}{365}$  yr. time to 1st payment.

		28	15
		14	1
yrs.	d.	<u>    </u>	<u>    </u>
2	42	42	14

or  $2\frac{42}{365}$  yrs. time from 1st to 4th payment.

		275	15
		14	1
yr.	d.	<u>    </u>	<u>    </u>
1	261	261	14

or  $1\frac{261}{365}$  yr. time from 4th payment.

625			
.07			
<u>    </u>			
43.75			
62			
<u>    </u>			
8750			
26250			
<u>    </u>			
365)2712.50(7.43	180		
2555	7.43		
<u>    </u>	<u>    </u>		
1575	172.57	625	
1460	ex- cess.	172.57	
<u>    </u>		<u>    </u>	
1150		\$452.43	
1095		.07	
<u>    </u>		<u>    </u>	
550		31.6701	
	5.50	242	
	2.	<u>    </u>	
	200.	63.3402	
	<u>    </u>	364	
	207.50	<u>    </u>	
	66.98	66.98	
	<u>    </u>		
	140.52 excess.		

rem. The interest on this rem. to the 2nd payment is plainly greater than \$5.50, and the interest to the 3d payment is plainly greater than \$7.50.

	31.67	
	42	
	<u>    </u>	
	6334	
	12668	
365)1330.14(3.64	<u>    </u>	
	1095	
	<u>    </u>	
	2351	
	2190	
	<u>    </u>	
	1614	
	1460	
	<u>    </u>	
	1540	

(Carried over.)

## SIMPLE INTEREST.

(Brought over.)

452.43	1st rem.	218337
140.52		261
<hr/>		
311.91	2nd rem.	218337
.07		1310022
<hr/>		
218337		436674
156125	365)	56985957 (15.6125
<hr/>		
374462		365
311.91		2048
<hr/>		
Ans. \$349.36		1825
<hr/>		
		2235
		2190
<hr/>		
		459
		365
<hr/>		
		945
		730
<hr/>		
		2150
		1825
<hr/>		
		325

(4)

	304	13
	12	1
d.	<hr/>	
292	292	12
or $\frac{292}{365}$ yr. time to 3d payment. The interest to the 1st payment is plainly more than \$3, and the interest to the 2nd payment is plainly more than \$8.		

	30	29
	28	1
d.	<hr/>	
58	58	28
or $\frac{58}{365}$ yr. time from 3d payment to July 29th, 1829.		

(Carried over.)

$\begin{array}{r} 210.14 \\ .06 \\ \hline 126084 \\ 292 \\ \hline 252168 \\ 1134756 \\ 252168 \\ \hline 365) 36816528 (10.086 \\ 365 \quad \text{[or } 10.09 \\ \hline 3165 \\ 2920 \\ \hline 2452 \\ 2190 \\ \hline 262 \end{array}$	$\begin{array}{r} 3 \\ 5 \\ \hline 180.25 \\ 188.25 \\ 10.09 \\ \hline 178.16 \text{ excess.} \end{array}$	$\begin{array}{r} 210.14 \\ 178.16 \\ \hline 31.98 \text{ rem.} \\ .06 \\ \hline 19188 \\ 58 \\ \hline 153504 \\ 95940 \\ \hline 365) 1112904 (.304 \\ 1095 \\ \hline 1790 \\ 1460 \\ \hline 330 \end{array}$
	$\begin{array}{r} 31.98 \\ .30 \\ \hline \text{Ans. } \$32.28 \end{array}$	

(5)

$\begin{array}{r} 600 \\ .06 \\ 12) \overline{36.00} (3 \\ 36 \end{array}$	$\begin{array}{r} 100 \\ 3 \\ \hline 97 \text{ excess.} \end{array}$	$\begin{array}{r} 600 \\ 97 \\ \hline 503 \text{ 1st rem.} \\ .06 \\ 12) \overline{30.18} (2.515 \\ 24 \\ \hline 61 \\ 60 \\ \hline 18 \\ 12 \\ \hline 60 \\ 60 \end{array}$
		$\begin{array}{r} 100 \\ 2515 \\ \hline 97485 \text{ excess.} \\ \\ \text{(Carried over.)} \end{array}$



## SIMPLE INTEREST.

(Brought over.)

503			
97.485			
<hr/>			
405.515 2d rem.			
.06			
<hr/>			
12) 24.33090 (2.027	100		
24	2.027		
<hr/>	<hr/>		
33	97.973 excess.	405.515	
24		97.973	
<hr/>		<hr/>	
90		307.542 3d rem.	
84		.06	
<hr/>		<hr/>	
6		12) 18.45252 (1.537	100
		12	1.54
		<hr/>	<hr/>
		64	98.46
		60	[excess.]
		<hr/>	
		45	
		36	
		<hr/>	
		92	
		84	
		<hr/>	
		9	
307.54			
98.46			
<hr/>			
209.08 4th rem.			
.06			
<hr/>			
12) 12.5448 (1.045	100		
12	1.05		
<hr/>	<hr/>		
54	209.08		
48	98.95 excess.	98.95	
<hr/>	<hr/>	<hr/>	
64		110.13 5th rem.	
60		.06	
<hr/>		<hr/>	
4		12) 6.6078 (.550	110.13
		60	.55
		<hr/>	<hr/>
		60	Ans. \$110.68
		60	
		<hr/>	
		7	

(6)

	153	13	25.50	
	10	3	.06	
d.	<u>163</u>	<u>10</u>	1530	
163	163	10	163	
or $\frac{163}{365}$ yr. time to 1st payment.			459	
	31	13	918	
	12	1	153	
d.	<u>19</u>	<u>12</u>	365) 24939 (.683	18.12
19	19	12	2190	68
or $\frac{19}{365}$ yr. time from 1st payment to 2d payment.			3039	17.44
			2920	[excess.
d.	<u>151</u>	<u>12</u>	1190	
151	151	12	1095	
or $\frac{151}{365}$ yr. time from 2d payment to July 1st, 1836.			95	
	25.50			
	17.44			
	<u>8.06</u> 1st rem.			
	.06			
	<u>.4836</u>			
	19			
	<u>43524</u>			
	4836			
365) 9.1884 (.025	2.00			
730 or .03	.03			
	<u>1888</u>		8.06	
	1825	1.97 excess.	1.97	
	<u>634</u>		6.09 2d rem.	
			.06	
			<u>.3654</u>	
			151	
			<u>3654</u>	
			18270	
			3654	
			<u>365</u>	
			55.1754 (.15	6.09
			365	.15
			1867	Ans. \$6.24
			1825	
			<u>415</u>	

## Lesson 132.

(1)

	334	29	210.14	
	16	13	.06	
d.	<u>350</u>	<u>16</u>	126084	
or $\frac{342}{365}$ yr. time the principal runs.	212	29	350	
	17	12	630420	
d.	<u>229</u>	<u>17</u>	378252	
or $\frac{222}{365}$ yr. time 1st payment runs.	61	29	365) 44129400 (12.09	
	27	2	365	
d.	<u>88</u>	<u>27</u>	762	210.14
or $\frac{82}{365}$ yr. time 2d payment runs.	30	29	730	12.09
	28	1		222.23
d.	<u>58</u>	<u>28</u>	3294	[am. of prin.]
or $\frac{52}{365}$ yr. time 3d payment runs.	28	1	3285	
			90	
229	88	180.25		
3	5	58		
687	440	144200		
		90125		
		1045450		
		687		
		440		
		1158150		
		.06		
365) 694890 (1.903			3	
			5	
			180.25	
			1.90	
				222.23
		3298	190.15 amounts	190.15
		3285	[of payments.	
			Ans. \$3208	
		1390		
		1095		
		295		

(2)

<u>600</u>	<u>100</u>					
.06	.06					
2) <u>36.00</u>	12) <u>6.00</u>	(.50	.50	.50	.50	
	60	5	4	3	2	
18						
<u>600</u>		<u>2.50</u>	<u>2.00</u>	<u>1.50</u>	<u>1.00</u>	.50
618 amount of	100	100	100	100	100	100
[prin.	<u>102.50</u>	<u>102.00</u>	<u>101.50</u>	<u>101.00</u>	<u>100.50</u>	
	102.50					
	102.00					
	101.50					
	101.00					
	100.50					
618						
<u>507.50</u>						
	507.50	amounts of payments.				
Ans. \$ 110.50						

(3)

	334			25.50		
	1	3		.06		
	<u>335</u>	<u>1</u>		<u>1.530</u>		
	2	2		333		
d.				<u>459</u>		
333	333			459		
or $\frac{333}{365}$ yr. time the principal runs.				459		
	181					
	1	13				
	<u>182</u>	<u>1</u>	365)	<u>509.49</u>	(1.395	25.50
	12	12		365	[or 1.40	1.40
d.				<u>1444</u>		
170	170			1095	[amount of prin.	26.90
or $\frac{170}{365}$ yr. time 1st payment runs.				<u>3499</u>		
	150			3285		
	1					
d.				<u>2140</u>		
151	151			1825		
or $\frac{151}{365}$ yr. time 2d payment runs.				<u>315</u>		

(Carried over.)

(Brought over.)

18.12				
170				
<hr/>				
12684	151			
1812	2			
<hr/>				
3080.40	302			
3080.40				
302				
<hr/>				
3382.40				
.06				
<hr/>				
365) 2029.44 (.556	18.12			
1825 [or .56	2.00			
	.56			
<hr/>				
2044	20.68	amounts of	26.90	
1825	[payments.		20.68	
<hr/>				
2194			Ans. \$6.22	
2190				
<hr/>				
4				

(4)

d.			214	2
306			1	1
or $\frac{306}{365}$ yr. time the 1st Dr. item				
			d.	
	245	5	213	213
	4	1		1
	<hr/>			
d.			153	12
241	241	4	11	1
or $\frac{241}{365}$ yr. time the 2nd Dr. item				
			d.	
	122	8	142	142
	7	1		11
	<hr/>			
d.			31	20
115	115	7	19	1
or $\frac{115}{365}$ yr. time the 3d Dr. item				
			d.	
			12	12
				19
			or $\frac{12}{365}$ yr. time the 3d Cr. item	
				[runs.

(Carried over.)

	(Brought over.)		
306	241	115	
200	50	130	
<hr/>	<hr/>	<hr/>	
61200	12050	345	
		115	
61200		<hr/>	
12050		14950	
14950			
<hr/>			
88200			
.06		200	
<hr/>		50	
365) 5292.00 (14.498		130	
365	[or 14.50	14.50	
<hr/>		<hr/>	
1642		39450 amount of Dr. side.	
1460			
<hr/>			
1820			
1460			
<hr/>			
3600			
3285			
<hr/>			
3150			
2920			
<hr/>			
230			
<hr/>			
213	142	125	
100	85	12	
<hr/>	<hr/>	<hr/>	
21300	710	250	
	1136	125	
21300	<hr/>	<hr/>	
12070	12070	1500	
1500			
<hr/>			
34870		100	
.06		85	
<hr/>		125	
365) 2092.20 (5.73		5.73	
1825		<hr/>	
<hr/>		315.73 amount of Cr. side.	
2672			
2555		39450	
<hr/>		31573	
1170		<hr/>	
1045		Ans. \$78.77 due David Sibley.	
<hr/>			
75			

(5)

	181	21		304	11
	10	11		1	10
d.	<u>171</u>	<u>10</u>	d.	<u>305</u>	<u>1</u>
or $\frac{171}{365}$ yr. time the 1st Dr. item	171	10	or $\frac{305}{365}$ yr. time the 1st Cr. item	305	1
		[runs.]		212	18
d.				7	11
61			d.	<u>205</u>	<u>7</u>
or $\frac{61}{365}$ yr. time the 2nd Dr. item			or $\frac{205}{365}$ yr. time the 2d Cr. item	205	7
	31	11			[runs.]
	5	6		181	11
d.	<u>36</u>	<u>5</u>	d.	<u>5</u>	<u>6</u>
or $\frac{36}{365}$ yr. time the 3d Dr. item	36	5	186	186	5
		[runs.]	or $\frac{186}{365}$ yr. time the 3d Cr. item		
			d.		[runs.]
			122		
			or $\frac{122}{365}$ yr. time the 4th Cr. item		
					[runs.]

171	61	175
75	200	36
<u>855</u>	<u>12200</u>	<u>1050</u>
1197		525
<u>12825</u>		<u>6300</u>
12825		
12200		
6300		
<u>31325</u>		
.07		
365) 2192.75 (6.007		75
2190 [or 6.01		200
		175
		<u>601</u>
2750		45601 amount of Dr. side,
2555		
<u>195</u>		

(Carried over.)

					(Brought over.)		
	305		205		186		122
	250		75		60		100
	<u>1525</u>		<u>1025</u>		<u>11160</u>		<u>12200</u>
	610		1435				
	<u>76250</u>		<u>15375</u>				
	76250						
	15375						
	11160						
	<u>12200</u>						
	114985			250			
	.07			75			
				60			
				100			
365)	8048.95	(22.05		22.05			
	<u>730</u>			<u>507.05</u>	amount of Cr. side.		
	748						
	<u>730</u>			507.05			
				<u>456.01</u>			
	1895						
	<u>1825</u>			Ans. \$51.04 due R. Leach.			
	700						
	(6)						
	181	2					
	<u>1</u>	<u>1</u>					
d.							
180	180	1		180	29		
or $\frac{180}{365}$ yr. time 1st Dr. item runs.	30	2		40	100		
	<u>1</u>	<u>1</u>		<u>7200</u>	<u>2900</u>		
d.				7200			
29	29	1		2900			
or $\frac{29}{365}$ yr. time 2nd Dr. item runs.	150	12		<u>10100</u>			
	<u>11</u>	<u>1</u>		.05			
d.				365) 505.00	(1.383	40	
139	139	11		365	or 1.38	100	
or $\frac{139}{365}$ yr. time 1st Cr. item runs.				<u>1400</u>		1.38	
d.				1095		<u>141.38</u>	
122				<u>3050</u>		amount of	
or $\frac{122}{365}$ yr. time 2nd Cr. item runs.				<u>2920</u>		Dr. side.	
	61	4		<u>1300</u>			
d.				1095			
58	58	3		<u>205</u>			
or $\frac{58}{365}$ yr. time 3d Cr. item runs.					(Carried over.)		



## COMPOUND INTEREST.

(Brought over.)		
139	122	58
50	60	20
<u>6950</u>	<u>7320</u>	<u>1160</u>
6950		
7320		
1160		
<u>15430</u>		
.05		50
365) <u>771.50</u>	(2.113	60
730	or \$2.11	20
<u>415</u>		<u>2.11</u>
365		132.11 amount of Cr. side.
<u>500</u>		
365		141.38
<u>1350</u>		<u>13211</u>
1095		Ans. \$9.27 due James Colburn.
<u>255</u>		

## COMPOUND INTEREST.

## Lesson 133.

(2)

255.167	
1.06	
<u>1531002</u>	
255167	
<u>27047702</u>	amount for 1 yr.
1.06	
<u>162286212</u>	
27047702	
<u>2867056412</u>	amount for 2 yrs.
1.06	
<u>17202338472</u>	
2867056412	
<u>303908979672</u>	amount for 3 yrs.
1.06	
<u>1823453878032</u>	
303908979672	
<u>32214351845232</u>	amount for 4 yrs.
(Carried over.)	

(Brought over.)

$$\begin{array}{r}
 322.14351845232 \text{ amount for 4 yrs.} \\
 \underline{1.06} \\
 193286111071392 \\
 32214351845232 \\
 341.4721295594592 \text{ am. for 5 yrs.} \quad 341.472 \\
 \underline{5.122} \quad .06 \\
 346.594 \quad 4) \underline{2048832} \\
 \text{Ans. \$ } 346.59 \quad \underline{5.122}
 \end{array}$$

(3)

$$\begin{array}{r}
 365 \\
 40 \\
 90) \underline{405} (4 \frac{1}{2} \text{ quarters.} \quad 4).07 \\
 360 \quad .0175 \text{ for 90 d. or 1 quarter.} \\
 45) \underline{45} (\frac{1}{2} \quad 1.0175 \\
 \quad \underline{1000} \\
 \quad 1017.5000 \text{ amount for 1 qr.} \\
 \quad \underline{1.0175} \\
 \quad 50875 \\
 \quad 71225 \\
 \quad 10175 \\
 \quad 10175 \\
 \quad \underline{1035.30625} \text{ amount for 2 qrs.} \\
 \quad \underline{1.0175} \\
 \quad 517653125 \\
 \quad 724714375 \\
 \quad 103530625 \\
 \quad 103530625 \\
 \quad \underline{1053.424109375} \text{ amount for 3 qrs.} \\
 \quad \underline{1.0175} \\
 \quad 5267120 \\
 \quad 7373968 \\
 \quad 1053424 \\
 \quad 1053424 \\
 \quad \underline{1071.8589200} \text{ amount for 4 qrs.} \quad 1071.8589 \\
 \quad 9.37876 \quad .0175 \\
 \quad 1081.23778 \quad \underline{53592945} \\
 \text{Ans. \$ } 1,081.24 \quad 75030123 \\
 \quad 10718589 \\
 \quad 2) \underline{1875753075} \\
 \quad \underline{9.378765} \text{ in. for} \\
 \quad \quad [\frac{1}{2} \text{ quarter.}]
 \end{array}$$

## COMPOUND INTEREST.

(4)

1843.125

1.06

---

11058750

1843125

---

1953.71250 amount for 1 yr.

1.06

---

117222750

19537125

---

2070.935250 amount for 2 yrs.

1.06

---

1242561150

207093525

---

2195.1913650 amount for 3 yrs.

1.06

---

13171148190

2195191365

---

2326.90284690 amount for 4 yrs.

1.06

---

139614170814

23269028469

---

2466.517017714 amount for 5 yrs.

1.06

---

14799102

2466517

---

2614.50802 amount for 6 yrs.

Ans. \$2,614.51

(5)

$  \begin{array}{r}  365 \\  \underline{3} \\  90) 1095 \text{ (12 } \frac{1}{4} \text{ quarters.} \\  \underline{90} \\  195 \\  \underline{180} \\  15) \frac{15}{16} (\frac{1}{8}  \end{array}  $	$  \begin{array}{r}  4).06 \\  \underline{.015} \text{ for 90 d. or 1 quarter.} \\  1.015 \\  \underline{1200} \\  2030 \\  \underline{1015} \\  1218.000 \text{ amount for 1 qr.} \\  \underline{1.015} \\  6090 \\  \underline{1218} \\  1218 \\  \underline{1236.270} \text{ amount for 2 qrs.} \\  \underline{1.015} \\  618135 \\  \underline{123627} \\  123627 \\  \underline{1254.81405} \text{ amount for 3 qrs.} \\  \underline{1.015} \\  627407025 \\  \underline{125481405} \\  125481405 \\  \underline{1273.63626075} \text{ amount for 4 qrs.} \\  \underline{1.015} \\  636818130 \\  \underline{127363626} \\  127363626 \\  \underline{1292.74080390} \text{ amount for 5 qrs.} \\  \underline{1.015} \\  64637040 \\  \underline{12927408} \\  12927408 \\  \underline{1312.1319120} \text{ amount for 6 qrs.} \\  \text{(Carried over.)}  \end{array}  $
--	---

## COMPOUND INTEREST.

(Brought over.)

1312.1319120 am. for 6 qrs.

1.015

6560659560

1312131912

1312131912

1331.813890680 am. for 7 qrs.

1.015

665906945

133181389

133181389

1351.79109835 amount for 8 qrs.

1.015

6758955490

1351791098

1351791098

1372.067964470 amount for 9 qrs.

1.015

686033982235

137206796447

137206796447

1392.64898393705 amount for 10 qrs.

1.015

696324490

139264898

139264898

1413.53871470 amount for 11 qrs.

1.015

1434.74178

.015

70676935

14135387

14135387

717370890

143474178

6) 2152112670

1434.7417805 amount for 12 qrs.

358685445

In. for  $\frac{1}{4}$  qr. 358685445

1438.32863495

1200

\$238.33 Ans.



## DISCOUNT.

## Lesson 134.

(1)	(2)	(3)
195	17.50	\$ .07 interest of \$ 1 for 1 yr.
23	.12	1.
<u>Ans. \$ 172</u>	350	<u>1.07) 500.00 (467.289</u>
	175	428
	2.100	720
	17.50	642
	2.10	<u>780</u>
	<u>Ans. \$ 15.40</u>	749
(4)		<u>310</u>
467.29		214
.07		<u>960</u>
<u>32.7103</u>		856
Add 467.29		<u>1040</u>
<u>Ans. \$ 500.00</u>		963
		<u>77</u>
(5)	(6)	
\$ .06 in. of \$ 1 for 1 yr.	2) .06	
4) .06	<u>.03</u>	
.015	1.	
<u>3</u>		
.045 in. of \$ 1 for 9 mos.	1.03) 1850.375 (1796.48	
1.	103	
<u>1.045) 385.000 (368.42</u>	820	1850.375
3135	721	1796.48
[Ans.	<u>993</u>	538.95
	927	<u>Ans. \$ 53.90</u>
7150	<u>667</u>	
6270	618	
<u>8800</u>	<u>495</u>	
8360	412	
<u>4400</u>	<u>830</u>	
4180	824	
<u>2200</u>	<u>6</u>	
2090		
<u>110</u>		

(7)

$$\begin{array}{r}
 276 \\
 .07 \\
 \hline
 365) 19.32 (.0529315 \\
 1825 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1070 \\
 730 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 3400 \\
 3285 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1150 \\
 1095 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 550 \\
 365 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1850 \\
 1825 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 25 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1.0529315) 9825.0000000 (9,331.09 \\
 94763835 \\
 \hline
 \end{array}$$

[Ans.

$$\begin{array}{r}
 34861650 \\
 31587945 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 32737050 \\
 31587945 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 11491050 \\
 10529315 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 96173500 \\
 94763835 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1409665 \\
 \hline
 \end{array}$$

(8)

$$\begin{array}{r}
 80 \\
 .07 \\
 \hline
 3) 5.60 \\
 18666 \\
 80 \\
 \hline
 81.8666
 \end{array}$$

$$\begin{array}{r}
 16 \\
 .07 \\
 \hline
 6) 1.12 \\
 18666 \\
 16 \\
 \hline
 16.18666
 \end{array}$$

(Carried over.)



## DISCOUNT.

(Brought over.)

6) .07

25		.011666	
.07		1.	
12) 1.75 (1.458	25.1458	1.011666	40.000000 (39.5387
12			3034998
55			9650020
48			9104994
70			5450260
60			5058330
100			3919300
96			3034998
4	81.8666		8843020
	16.1866		8093328
	25.1458		7496920
	39.5387		7081662
	162.7377		415258
	Ans. \$162.74		

1.157625	(9) 9261.000000	\$ (8,000	
	9261000	[Ans.	500
			.07
	000		35.00
			Ans. \$465

		(11)	
80	16	25	
.07	.07	.07	
3) 5.60	6) 1.12	12) 1.75 (.1458	25.1458
1.8666	.18666	12	
80	16	55	40
81.8666	16.18666	48	.07
		70	6) 2.80
		60	40.
81.8666		100	.4666
16.1866		96	.4666
25.1458			39.5333
39.5333			
162.7323		4	
\$162.73 Ans.			

DISCOUNT.

115

(12)

				62	20
				16	4
\$ 475 due Sept. 4th.	July 20th to Sept. 4th,			46 d.	16
				153	21
				1	20
\$ 320 due Dec. 21st.	July 20th to Dec. 21st,			154 d.	1
\$ 100 due Dec. 30th.	July 20th to Dec. 30th,			163 d.	
				92	21
				1	20
\$ 287 due Oct. 21st.	July 20th to Oct. 21st,			93 d.	1
\$ 300 on in. from July 12th to July 20th,				8 d.	
475	154	163	287		
46	320	100	93		
2850	308	16300	861		
1900	462		2583		
21850	49280		26691	287	
			.06	300	
21850				587	
49280			365)1601.46(4.387	4.39	
16300	475		1460		
	320			582.61	
87430	100		1414	.39	
.06			1095		
	895			583.00	
365)5245.80(14.37	14.37		3196		
365			2920		
	880.63				
1595	583.		2760		
1460			2555		
	Ans. \$ 297.63			300	
1358				.06	
1095					
2630				18.00	
2555				8	
75					
			365)144.0(3.94		
			1095		
				3450	
				3285	
				1650	
				1460	

## BANKING.

## Lesson 135.

<p>(1)</p> $\begin{array}{r} 683 \\ .06 \\ \hline 6) 40.98 \\ \hline 683 \\ .34 \\ \hline 7.17 \end{array}$ <p>3 days are <math>\frac{3}{80}</math> or <math>\frac{1}{26}</math> of 60 d.</p> $\begin{array}{r} 2) 0 \mid 6.83 \\ \hline .34 \end{array}$ <p>683</p> $\begin{array}{r} 7.17 \\ 7.17 \\ \hline \end{array}$ <p>Ans. \$675.83</p>	<p>(2)</p> $\begin{array}{r} 3327.40 \\ .07 \\ \hline 4) 2329180 \\ \hline 582295 \\ 194 \\ \hline \end{array}$ <p>3 days are <math>\frac{3}{80}</math> or <math>\frac{1}{26}</math> of 90 d.</p> $\begin{array}{r} 3) 0 \mid 582295 \\ \hline 194 \end{array}$ <p>Ans. \$60.17</p>
---	---

<p>(3)</p> $\begin{array}{r} 5) 0 \mid 10000 \\ \hline 200 \text{ bales.} \\ 60 \\ \hline 12000 \\ .06 \\ \hline 4) 720.00 \\ \hline 180 \\ 6 \\ \hline 186 \end{array}$ <p>3) 0 \mid 18 \mid 0</p> $\begin{array}{r} 6 \\ \hline 12000 \\ 186 \\ \hline 11814 \\ 10000 \\ \hline \end{array}$ <p>Ans. \$1,814</p>	<p>(4)</p> $\begin{array}{r} 982 \\ .07 \\ \hline 68.74 \\ 73 \text{ days.} \\ \hline 20622 \\ 48118 \\ \hline 36) 501 \mid 8.02 \mid 13.938 \\ 36 \\ \hline 141 \\ 108 \\ \hline 338 \\ 324 \\ \hline 140 \\ 108 \\ \hline 322 \\ 288 \\ \hline 34 \end{array}$ <p>982</p> $\begin{array}{r} 13.94 \\ \hline 9968.06 \\ \hline \end{array}$ <p>[Ans.]</p>
--	--

<p style="text-align: center;">(5)</p> $\begin{array}{r} 2500 \\ .06 \\ \hline 3) 150.00 \\ \hline 50 \\ 1.25 \\ \hline \end{array}$ <p>Ans. \$ 5 1.25</p>	3 d. are $\frac{3}{120}$ or $\frac{1}{40}$ of 120 d.	<p style="text-align: center;">(6)</p> $\begin{array}{r} 700 \\ .07 \\ \hline 4) 49.00 \\ \hline 12.25 \\ .408 \\ \hline \end{array}$ <p>Ans. \$ 12.66</p>
<p style="text-align: center;">(7)</p> $\begin{array}{r} 2000 \\ .06 \\ \hline 12) 120.00 \\ \hline 12 \\ 0 \end{array}$	3 d. are $\frac{3}{120}$ or $\frac{1}{40}$ of 30 d.	<p style="text-align: center;">(8)</p> $\begin{array}{r} 100 \\ .06 \\ \hline 6) 6.00 \\ \hline 1 \\ .05 \\ \hline \end{array}$ <p>Ans. \$ 1.05</p>

(10)

$$\begin{array}{r} 1 \\ 11 \\ \hline \end{array}$$

(11)

$$\begin{array}{r} 1 \\ 11 \\ \hline \end{array}$$

(12)

$$\begin{array}{r} 1 \\ 11 \\ \hline \end{array}$$

Ans. \$ 1,989

## EQUATION OF PAYMENTS.

## Lesson 136.

(1)

<p>12).060(.005</p> $\begin{array}{r} 5 \\ \hline .025 \end{array}$	<p>4).06</p> $\begin{array}{r} .015 \\ 3 \\ \hline .045 \end{array}$
<p>1.025) 800.000 (780.487</p> $\begin{array}{r} 7175 \\ \hline 8250 \\ \bullet 8200 \\ \hline 5000 \\ 4100 \\ \hline 9000 \\ 8200 \\ \hline 8000 \\ 7175 \\ \hline 825 \end{array}$	<p>1.045) 650.000 (622.01</p> $\begin{array}{r} 6270 \\ \hline 2300 \\ 2090 \\ \hline 2100 \\ 2090 \\ \hline 1000 \\ 1045 \end{array}$

(Carried over.)

$$\begin{array}{r} \text{(1)} \\ 683 \\ .06 \\ \hline 6) 40.98 \\ \hline 6.8 \\ .3 \\ \hline \end{array}$$

561500  
 14750  
 140250  
 561500  
 47500  
 42075  
 54250  
 50490  
 37600  
 33660  
 39400  
 33660  
 57400  
 58905

$$\begin{array}{r} .56447 \text{ yr.} \\ \underline{12} \\ 112894 \\ 56447 \\ \hline 6.77364 \text{ mo.} \\ 30 \end{array}$$

**Ans. 6 mo. 23 d. about.**

**(2)**

$$\begin{array}{r} 3 \overline{) 0.06} \\ \underline{.02} \\ 1.02 \end{array} \begin{array}{r} 2500.00 \\ \underline{204} \\ 460 \\ \underline{408} \\ 520 \\ \underline{510} \\ 1000 \\ \underline{918} \\ 820 \\ \underline{816} \\ 4 \end{array} \begin{array}{r} (2450.98) \end{array}$$
$$\begin{array}{r}
 2 \overline{) 0.6} \\
 \underline{.03} \\
 1.03 \overline{) 350.00} \quad (339.805) \\
 \underline{309} \\
 410 \\
 \underline{309} \\
 1010 \\
 \underline{- 927} \\
 830 \\
 \underline{824} \\
 600 \\
 \underline{515} \\
 85
 \end{array}$$

(Carried over.)

		(Brought over.)	
.06			
2			
5).12			
.04			
1.04)1000.00(961.538	2450.98	2500	
936	339.81	350	
640	961.54	1000	
624	3752.33	3850	
160	.06	3752.33	
104	225.1398	225.1398	97.67000 (.4338)
560			9005592
520	.4338 yr.		7614080
400	12		6754194
312	8676		8598860
880	4338		6754194
832	5.2056 mo.		18446660
48	30		18011184
	6.1680 d.		435476

Ans. 5 mo. 6 d. about.

(3)

				.06	
				2	
4).06		2).06		3).12	
.015		.03		.04	
1.015)2030.000(2000	1.03)2575.00(2500	1.04)2600.00(2500			
2030	206	208			
000	515	520			
	515	520			
	2000	00			
	2500				
	2500				
1.06)2862.00(2700	2700				
212	9700	10067			
742	.06	9700			
742	582.00	582)367.0 (.63058		.63058 yr.	
00		3492		12	
		1780		126116	
		1746		63058	
		3400		756696 mo.	
		2910		30	
		4900		17.00880 d.	
		4656			
		244		7 mo. 17 d. about	
				[Ans.	

(4)

$$\begin{array}{r} 400 \\ .06 \\ \hline 2)2400 \end{array}$$

$$\begin{array}{r} 12 \\ 400 \\ \hline \end{array}$$

$$\begin{array}{r} 1200 \\ 412 \\ \hline 788 \\ .06 \\ \hline \end{array} \quad \begin{array}{r} 1200 \\ 400 \\ \hline 800 \\ 788 \\ \hline \end{array}$$

$$\begin{array}{r} 47.28 \quad 47.28)12000(.2538 \quad .2538 \text{ yr.} \\ 9456 \quad 12 \end{array}$$

$$\begin{array}{r} 25440 \\ 23640 \\ \hline \end{array} \quad \begin{array}{r} 5076 \\ 2538 \\ \hline \end{array}$$

$$\begin{array}{r} 18000 \\ 14184 \\ \hline \end{array} \quad \begin{array}{r} 30456 \text{ mo.} \\ 30 \end{array}$$

$$\begin{array}{r} 38160 \\ 37824 \\ \hline \end{array} \quad \begin{array}{r} 13680 \text{ d.} \end{array}$$

$$\begin{array}{r} 336 \end{array}$$

Ans. 3 mo. 1 d. about more  
than 6 mo.; or 9 mo.  
1 d. about.

(5)

$$\begin{array}{r} 800 \\ 5 \\ \hline 4000 \end{array} \quad \begin{array}{r} 650 \\ 9 \\ \hline 5850 \end{array}$$

$$\begin{array}{r} 800 \\ 650 \\ \hline 1450 \end{array} \quad \begin{array}{r} 4000 \\ 5850 \\ \hline 1450 \end{array} \quad \begin{array}{r} 9850 \\ 8700 \\ \hline 11500 \\ 10150 \\ \hline 13500 \\ 13050 \\ \hline 450 \end{array} \quad \begin{array}{r} 6.79 \text{ mo.} \\ 30 \\ \hline 2370 \text{ d.} \end{array}$$

Ans. 6 mo. 24 d. nearly.

(6)

$$\begin{array}{r} 2500 \\ 4 \\ \hline 10000 \end{array} \quad \begin{array}{r} 350 \\ 6 \\ \hline 2100 \end{array} \quad \begin{array}{r} 1000 \\ 8 \\ \hline 8000 \end{array}$$

$$\begin{array}{r} 2500 \\ 350 \\ 1000 \\ \hline 3850 \end{array} \quad \begin{array}{r} 10000 \\ 2100 \\ 8000 \\ \hline 19250 \end{array} \quad \begin{array}{r} 20100 \\ 30 \\ \hline 19250 \end{array} \quad \begin{array}{r} 5.22 \text{ mo.} \\ 30 \\ \hline 660 \text{ d.} \end{array}$$

$$\begin{array}{r} 8500 \\ 7700 \\ \hline 8000 \\ 7700 \\ \hline 300 \end{array} \quad \begin{array}{r} 5 \text{ mo. } 7 \text{ d.} \\ \text{[nearly Ans.]} \end{array}$$

	2030	25.75 <sup>(7)</sup>	2600	2862
	3	6	8	12
	<u>6090</u>	<u>15450</u>	<u>20800</u>	<u>5724</u>
	6090			2862
	15450			<u>34344</u>
	20800			
	34344			
10067)	76684	( 7.617 mo.	Ans. 7 mo. 19 d. nearly.	
	70469	30		
	<u>62150</u>	<u>18.510 d.</u>		
	60402			
	<u>17480</u>			
	10067			
	<u>74130</u>			
	70469			
	<u>3661</u>			

		(8)	90	19
			15	4
Jan. 4 to April 19,		105 d.	15	15
			90	7
			3	4
Jan. 4 to April 7,		93 d.	3	3
			31	28
			24	4
Jan. 4 to Feb. 28,		55 d.	24	24
	105		125	27
	72		93	55
	<u>210</u>		<u>375</u>	<u>135</u>
	735	1125	135	
	<u>7560</u>	<u>11625</u>	<u>1485</u>	
136				
27	7560	31		
12.50	1162.5	4	41	
72	1485	27	27	
<u>247.50</u>	247.5)	10207.5	(41 d. or Feb. 14	Ans.
		9900		
		<u>3075</u>		
		2475		
		<u>600</u>		



## EQUATION OF PAYMENTS.

(9)

	61	8	Items of Cash are not on credit. Item	
	3	5	of Ready made Clothing is due 4 mo.	
Sept. 5 to Nov. 8,	64 d.	3	from Nov. 11, or March 11, 1841.	
	61	5	181	18
	4	1	7	11
Sept. 5 to Nov. 1,	57 d.	4	Sept. 18 to March 11,	174 d. 7
Sept. 5 to Sept. 24,	19 d.		30	18
			16	2
		Sept. 18 to Oct. 2,	14 d.	16
		120	68	185.5
		64	57	19
		48	476	16695
		72	340	1855
340		7680	3876	3524.5
185.5		7680		
68		3876		
120		3524.5		
713.5	713.5)	15080.5	(21 d. from Sept. 5, or Sept.	
		14270	26. Average time to pay	
		8105	Dr. side, is 4 mo. from	
		7135	Sept. 26, or Jan. 26, 1841.	
		970		
		1948	14	
		174	100	
		7792	1400	
		13636		
		1948		
200		33895.2		
100		33895.2		
194.80		1400		
494.80	494.8)	35295.2	(71 d. from Sept. 18, or Nov. 28 ;	
		34636	average time to pay Cr. side.	
		6592		
		4948		
		1644	(Carried over.)	

(Brought over.)

	61	28
From Nov. 28, the average time to pay Cr. side	2	26
to Jan. 26, the average time to pay Dr. side, is	59 d.	2
	713.50	
	494.80	

Now how long may the balance, or \$218.70 remain unpaid to equal the use of \$494.80 during 59 d.?

	494.8	
	59	
	<u>44532</u>	
	24740	
218.7)	29193.2	(133 d. from Jan. 26, 1841, or till
	2187	June 8, 1841. Ans.
	<u>7323</u>	
	6561	
	<u>7622</u>	
	6561	
	<u>10610</u>	

PROMISCUOUS QUESTIONS

IN

PERCENTAGE, COMMISSION, STOCKS, AND SIMILAR RULES.

Lesson 138.

yr.	d.	(1)		
1	108		123	18
or $1\frac{108}{365}$ yr.			15	3
			<u>108</u>	<u>15</u>
	100			
	<u>.053</u>			
	5.00			575
	.25 — $\frac{1}{4}$			108
	.50 — $\frac{2}{4}$			<u>4600</u>
	<u>5.75</u>			575
	1.70		365)	<u>621.00</u> (1.70
Ans	\$7.45			365
				<u>2560</u>
				2555
				<u>50</u>

$$\begin{array}{r}
 (2) \\
 1.00 \\
 .05 \\
 \hline
 .95 \overline{) 2850} \text{ (30 Ans.} \\
 \underline{285} \\
 0
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 1.00 \\
 .08 \\
 \hline
 .92 \overline{) 276.00} \text{ (300 Ans.} \\
 \underline{276} \\
 00
 \end{array}$$

(5)

$$\begin{array}{r}
 \text{yr. mo. d.} \\
 1 \quad 3 \quad 5 \\
 30 \overline{) 5.0}
 \end{array}$$

(4)

$$\begin{array}{r}
 3900 \\
 .02 \\
 \hline
 78.00
 \end{array}$$

$$\begin{array}{r}
 3900 \\
 78 \\
 \hline
 3822
 \end{array}$$

$$\begin{array}{r}
 3822 \\
 .15 \\
 \hline
 19110
 \end{array}$$

$$\begin{array}{r}
 19110 \\
 3822 \\
 \hline
 15288
 \end{array}$$

Ans. \$573.30

$$\begin{array}{r}
 12) 31666 \text{ \&c. (} .2638 \\
 \underline{24} \\
 76
 \end{array}$$

$$\begin{array}{r}
 76 \\
 72 \\
 \hline
 46
 \end{array}$$

$$\begin{array}{r}
 46 \\
 36 \\
 \hline
 106
 \end{array}$$

$$\begin{array}{r}
 106 \\
 96 \\
 \hline
 10
 \end{array}$$

10

$$\begin{array}{r}
 1.2638 \text{ yr.} \\
 200 \\
 \hline
 252.7600
 \end{array}$$

$$\begin{array}{r}
 252.7600) 126400 \text{ [Ans.} \\
 \underline{126380} \\
 20
 \end{array}$$

(6)

$$\begin{array}{r}
 \text{lbs. oz.} \\
 15 \quad 10
 \end{array}$$

$$\begin{array}{r}
 12) 100 \text{ (.8333 \&c.} \\
 \underline{96} \\
 40
 \end{array}$$

$$\begin{array}{r}
 40 \\
 36 \\
 \hline
 4
 \end{array}$$

4

Ans. \$6.174987

$$\begin{array}{r}
 15.8333 \text{ \&c. lbs.} \\
 13 \\
 \hline
 474999
 \end{array}$$

$$\begin{array}{r}
 474999 \\
 158333 \\
 \hline
 2058329
 \end{array}$$

$$\begin{array}{r}
 2058329 \\
 .03 \\
 \hline
 6174987
 \end{array}$$

(7)

$$\begin{array}{r}
 1200 \\
 .07 \\
 \hline
 84.00
 \end{array}$$

$$\begin{array}{r}
 1216.80 \\
 1200 \\
 \hline
 16.80
 \end{array}$$

$$\begin{array}{r}
 84) 16.80 \text{ (.2 yr.} \\
 \underline{168}
 \end{array}$$

$$\begin{array}{r}
 365 \\
 .2 \\
 \hline
 730
 \end{array}$$

Ans. 730 d.

(8)

$$\begin{array}{r} 100 \\ 8 \\ \hline 800 \end{array} \begin{array}{l} 26.666 \text{ \&c.} \\ .03333 \text{ \&c.} \\ \text{or } .03\frac{1}{3} \text{ Ans.} \end{array}$$

(9)

yrs.	mo.
2	8
or $2\frac{2}{3}$ yrs.	
.06	.06
2	2
<u>.12</u>	<u>.12</u>
.04	3) .12
<u>.16</u>	<u>.04</u>
1.16	\$
1.16) 8120	70 Ans.
812	
<u>0</u>	

(10)

800	3 d. are $\frac{3}{90}$ or $\frac{1}{30}$ of 90 d.
.06	
<u>4) 48.00</u>	$30) 12$
12.	<u>.40</u>
.40	
<u>12.40</u>	
800	
12.40	
<u>Ans. \$787.60</u>	

### Lesson 139.

(1)

.25	2000	2000
<u>2000</u>		<u>.10</u>
500.00		200.00
2000		<u>2000</u>
<u>2500</u> price marked.		2200
2200		
<u>300</u> amount to deduct.		
2500) 300.0	.12 Ans.	
2500		
<u>5000</u>		
5000		

(2)

	245	11		350	
	7	4		.06	
d.	<u>252</u>	<u>7</u>		<u>21.00</u>	
or $\frac{11}{365}$ yr. time to 1st payment.	252	7		252	
				<u>42</u>	
	151			105	
	1			<u>42</u>	
	<u>152</u>	13	365)	<u>5292</u>	14498
	2	11		365	or 14.50
d.	<u>154</u>	<u>2</u>		<u>1642</u>	50
or $\frac{11}{365}$ yr. time from 1st to 2nd	154	2		1460	14.50
[payment.]				<u>1820</u>	35.50
	153	13		1460	[excess.
	1	12		<u>3600</u>	
d.	<u>152</u>	<u>1</u>		<u>3285</u>	
or $\frac{11}{365}$ yr. time from 2nd payment	152	1		<u>3150</u>	
[to Nov. 12th.]				2920	
				<u>230</u>	
	350				
	35.50				
	<u>314.50</u> 1st rem.				
	.06				
	<u>18.870</u>				
	154				
	<u>7548</u>				
	9435				
	1887				
365)	<u>2905.98</u>	(7.96	25	314.50	
	2555		7.96	17.04	
	<u>3509</u>		<u>17.04</u> excess.	<u>297.46</u> 2d rem.	
	3285			.06	
	<u>2248</u>			<u>178476</u>	
	2190			152	
	<u>58</u>			<u>356952</u>	
				892380	
				<u>178476</u>	
365)	<u>2712.8352</u>	(7.43		743	
	2555			<u>297.46</u>	
	<u>1578</u>			Ans. \$304.89	
	1460				
	<u>1183</u>				
	1095				
	<u>88</u>				

(3)

$$\begin{array}{r}
 150 \\
 .06 \\
 \hline
 9.00 \\
 3 \\
 \hline
 4) 27 \\
 \hline
 6.75 \\
 150 \\
 \hline
 156.75
 \end{array}
 \qquad
 \begin{array}{r}
 400 \\
 156.75 \\
 \hline
 243.25 \\
 .06 \\
 \hline
 145950) 6.7500 (.46248 \text{ yr.} \\
 58380 \\
 \hline
 91200 \\
 87570 \\
 \hline
 36300 \\
 29190 \\
 \hline
 71100 \\
 58380 \\
 \hline
 127200 \\
 116760 \\
 \hline
 10440
 \end{array}
 \qquad
 \begin{array}{r}
 46248 \\
 12 \\
 \hline
 92496 \\
 46248 \\
 \hline
 554976 \text{ mo.} \\
 30 \\
 \hline
 1649280 \text{ d.}
 \end{array}$$

$$\begin{array}{r}
 (4) \\
 4000 \\
 .20 \\
 \hline
 \text{Ans. \$800.00}
 \end{array}
 \qquad
 \begin{array}{r}
 (5) \\
 10.676581 \\
 700 \\
 \hline
 7473.606700 \\
 \text{Ans. \$7,473.61}
 \end{array}$$

(6)

$$\begin{array}{r}
 .06 \\
 3 \\
 \hline
 4) .18 \\
 .045 \\
 \hline
 1. \\
 1.045) 11.300 (10.81 \\
 1045 \\
 \hline
 8500 \\
 8360 \\
 \hline
 1400 \\
 1045 \\
 \hline
 355
 \end{array}$$

(Carried over.)

(Brought over.)

$$\begin{array}{r}
 15 \\
 12 \\
 \hline
 3 \text{ mo.} \\
 .06 \quad 4).06 \\
 .015 \quad .015 \\
 1. \\
 \hline
 1.075) 65.000 (60.465 \\
 \underline{6450} \\
 5000 \\
 \underline{4300} \\
 7000 \\
 \underline{6450} \\
 5500 \\
 \underline{5375} \\
 125
 \end{array}$$

$$\begin{array}{r}
 18 \\
 12 \\
 \hline
 6 \text{ mo.} \\
 .06 \quad 2).06 \\
 .03 \quad .03 \\
 1. \\
 \hline
 1.09) 110.00 (100.917 \\
 \underline{109} \\
 1000 \\
 \underline{981} \\
 190 \\
 \underline{109} \\
 810 \\
 \underline{763} \\
 47
 \end{array}$$

$$\begin{array}{r}
 24296 \\
 1081 \\
 60.465 \\
 100.917 \\
 \hline
 415.15 \\
 .06 \\
 \hline
 249090
 \end{array}$$

$$\begin{array}{r}
 250.25 \\
 11.30 \\
 65. \\
 110. \\
 \hline
 436.55 \\
 415.15 \\
 \hline
 21.4000
 \end{array}$$

$$249090$$

$$24909) 214000 (.859 \text{ yr.}$$

$$.859$$

(7)

$$\begin{array}{r}
 580 \text{ yr. mo.} \\
 .06 \quad 1 \quad 3 \\
 \hline
 3480 \text{ or } 1\frac{1}{2} \text{ yr.} \\
 8.70 \quad 4) 34.80 \\
 \hline
 8.70 \\
 43.50
 \end{array}$$

$$\begin{array}{r}
 147280 \\
 124545 \\
 \hline
 227350 \\
 224181 \\
 \hline
 3169
 \end{array}$$

$$\begin{array}{r}
 1718 \\
 859 \\
 \hline
 10308 \text{ mo.} \\
 30 \\
 \hline
 9240 \text{ d.}
 \end{array}$$

Ans. 10 mo. 9 d. about.

$$\begin{array}{r}
 580 \\
 43.50 \\
 \hline
 536.50
 \end{array}$$

\$ 536.50 Ans.

(8)

	245	15	231	1000
	14	1	400	60
d.	<u>231</u>	<u>14</u>	<u>92400</u>	<u>60000</u>
or $\frac{231}{365}$ yr. time 1st Dr. item runs.				
	61	2	92400	
	1	1	60000	
d.	<u>60</u>	<u>1</u>	<u>152400</u>	
or $\frac{60}{365}$ yr. time 2d Dr. item runs.			.06	
	275	3	365) 9144.00	(25.05
	2	1	730	25.05
d.	<u>273</u>	<u>2</u>	<u>1844</u>	<u>400</u>
or $\frac{273}{365}$ yr. time 1st Cr. item runs.			1825	1000
	153	31		1425.05
	30	1	1900	
d.	<u>123</u>	<u>30</u>	<u>1825</u>	
or $\frac{123}{365}$ yr. time 2d Cr. item runs.			75	

273	123
800	900
<u>218400</u>	<u>110700</u>
218400	
110700	
<u>329100</u>	
.06	
365) 19746.00	54.10
1825	800
<u>1496</u>	<u>900</u>
1460	1754.10
<u>3600</u>	<u>1425.05</u>
3285	
<u>3150</u>	
2920	
<u>230</u>	

Ans. \$329.05 due George  
[Draper.]



## RULE OF THREE.

## Lesson 143.

<p>(1)</p> $\begin{array}{r} 18)324(18 \\ \underline{18} \\ 144 \\ \underline{144} \\ 0 \end{array}$ <p>Ans. \$414.</p>	<p>(2)</p> $\begin{array}{r} 18 \\ 23 \\ \underline{18} \\ 54 \\ \underline{36} \\ 18 \end{array}$ <p>Ans. 6</p>	<p>(3)</p> $\begin{array}{r} .4)2.0 \\ \underline{.4} \\ 2)5 \\ \underline{2} \\ 3 \end{array}$ <p>Ans. \$2.50</p>
---	--	--

<p>(4)</p> $\begin{array}{r} 4)26 \\ \underline{4} \\ 22 \\ \underline{20} \\ 2 \end{array}$ <p>Ans. \$123.50</p>	<p>(5)</p> $\begin{array}{r} 19)123.5(6.5 \\ \underline{114} \\ 95 \\ \underline{95} \\ 0 \end{array}$ <p>Ans. \$26.0</p>	<p>(6)</p> $\begin{array}{r} 5)125 \\ \underline{5} \\ 25 \\ \underline{25} \\ 0 \end{array}$ <p>Ans. 25</p>
---	---	--

<p>(7)</p> $\begin{array}{r} 12 \\ 6 \\ \underline{6} \\ 8)72 \\ \underline{72} \\ 0 \end{array}$ <p>Ans. 9 days.</p>	<p>(8)</p> $\begin{array}{r} \frac{2}{3} \text{ of } \frac{4}{5} \\ 3 \quad 2 \\ 5 \quad 4 \\ \underline{15} \quad \underline{8} \\ 15 \quad 8 \\ \underline{15} \quad \underline{15} \end{array}$	<p>(9)</p> $\begin{array}{r} 7500 \\ 15 \\ \underline{15} \\ 375 \\ 75 \\ \underline{75} \\ 0 \end{array}$ <p>Ans. \$14,062.50</p>
---	--	--

<p>(9)</p> $\begin{array}{r} 15 \\ 7 \\ \underline{7} \\ 22)35.20(1.60 \\ \underline{22} \\ 132 \\ \underline{132} \\ 0 \end{array}$	<p>(10)</p> $\begin{array}{r} \text{bu. pks.} \\ 18 \quad 3 \\ 4)3.0 \\ \underline{18} \\ 12 \\ \underline{12} \\ 0 \end{array}$	<p>(11)</p> $\begin{array}{r} 1.60 \\ 1.5 \\ \underline{1.5} \\ 80 \\ \underline{80} \\ 0 \end{array}$	<p>(12)</p> $\begin{array}{r} 1.60 \\ 7 \\ \underline{7} \\ 18.75)28.125(1.5 \\ \underline{18.75} \\ 9375 \end{array}$	<p>(13)</p> $\begin{array}{r} 1.5 \\ 1.0 \\ \underline{1.0} \\ 50 \\ \underline{50} \\ 0 \end{array}$
--	--	--	--	---

0 A. \$24.0, B. \$11.20 Ans.

Lesson 144.

$$\begin{array}{r}
 \text{(2)} \\
 18232 \\
 \underline{3} \\
 53 \overline{) 54696} \text{ (1,032 Ans.} \\
 \underline{53} \\
 169 \\
 \underline{159} \\
 106 \\
 \underline{106}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 6 \frac{3}{4} \\
 8) 3.0 \\
 \underline{5} \\
 6.375 \\
 \underline{1.275} \\
 12 \frac{3}{4} \\
 \underline{2550} \\
 1275 \\
 \underline{425} - \frac{1}{4} \\
 425 - \frac{1}{4} \\
 \underline{\hspace{1cm}}
 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \\
 20 \overline{) 16} \\
 \underline{3} \\
 70 \\
 \underline{\hspace{1cm}}
 \end{array}$$

Ans. \$ 16.150

Ans. 21.0

$$\begin{array}{r}
 \text{(5)} \\
 16 \\
 \underline{9} \\
 6 \overline{) 144}
 \end{array}$$

Ans. 24 days.

$$\begin{array}{r}
 \text{(6)} \\
 \frac{17}{12} \text{ for 1 soldier a day.} \\
 2300 \\
 \underline{17} \\
 161 \\
 \underline{23} \\
 12 \overline{) 39100} \text{ (3,258} \frac{1}{3} \text{ lbs. Ans.} \\
 \underline{36} \\
 31 \\
 \underline{24} \\
 70 \\
 \underline{60} \\
 100 \\
 \underline{96} \\
 4 \overline{) 12} \left( \frac{1}{3}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \text{cwt. qrs. lbs.} \\
 15 \quad 2 \quad 8 \frac{1}{4} \\
 28 \overline{) 8.25} \text{ (.2946} \\
 \underline{56} \\
 265 \\
 \underline{252} \\
 130 \\
 \underline{112} \\
 180 \\
 \underline{168} \\
 12
 \end{array}$$

$$\begin{array}{r}
 4 \overline{) 2.2946} \\
 \underline{\hspace{1cm}} \\
 \text{cwt. 15.57369} \\
 \underline{\hspace{1cm}} \\
 9344190 \\
 \underline{7786825} \\
 87.212440
 \end{array}$$

Ans. \$ 87.21

(8)

$$\begin{array}{r}
 \text{A. qrs. sq. rods.} \\
 83 \quad 3 \quad 17 \\
 40 \overline{) 17} \\
 4 \overline{) 3425} \\
 8385625 \text{ A.}
 \end{array}$$

$$\begin{array}{r}
 \text{A. qrs. sq. rods.} \\
 5 \quad 2 \quad 38 \\
 40 \overline{) 38} \\
 4 \overline{) 295} \\
 57375 \text{ A.}
 \end{array}$$

$$\begin{array}{r}
 8385625 \text{ ) } 83856250 \text{ (10 an acre.} \\
 \underline{8385625} \\
 0
 \end{array}$$

$$\begin{array}{r}
 57375 \\
 \underline{10} \\
 57375 \\
 \text{Ans. } \$ 57.37 \frac{1}{2}
 \end{array}$$

RULE OF THREE.

(9)

	hhds.	tier.	gals.
80) 18	2	1	23
<u>\$ .225 a gal.</u>	63		
	126		
	42		
	23		
	191		
	225		
	955		
	382		
	382		
Ans.	\$ 42975		

(10)

h.	min.	sec.	
1	23	10	24
60			3 d.
<u>60</u>			72
23			60
<u>83</u>			4320
60			60
<u>4980</u>			259200 sec.
10			16000
<u>4990</u>			15552
			2592
16000 cubic ft. 4990)			41472000.00
4990 [a sec.]			39920 (831,102 183 cubic ft. [Ans.]
			15520
			14970
			5500
			4990
			5100
			4990
			11000
			9980
			1020 or 102

Lesson 145.

<p>(1)</p> $\begin{array}{r} 5 \\ 3 \\ \hline 10 \overline{) 15} \\ \hline 1.5 \text{ or } 1\frac{1}{2} \text{ d.} \\ \text{[Ans.]} \end{array}$	<p>(2)</p> $\begin{array}{r} \frac{2}{3} \text{ of } \frac{2}{3} \\ 9 \quad 2 \\ 4 \quad 3 \\ \hline 36 \quad 6 \quad 12000 \\ \frac{2}{3} \text{ or } \frac{1}{3} \quad 6 \\ \hline \text{Ans. } \$72,000 \end{array}$	<p>(3)</p> $\begin{array}{r} 13\frac{1}{2} \\ 8 \overline{) 7.0} \\ \hline 13875 \\ 4 \\ \hline \text{Ans. } \$55.500 \end{array}$
<p>(4)</p> $\begin{array}{r} \text{cwt. qrs. lbs.} \\ 6 \quad 3 \quad 27 \\ 4 \\ \hline 24 \\ 3 \\ \hline 27 \\ 28 \\ \hline 216 \\ 54 \\ 27 \\ \hline 783 \\ 3 \\ \hline 2349 \\ \$ \frac{115}{2849} \text{ a lb.} \end{array}$	<p>(5)</p> $\begin{array}{r} 120 \\ 80 \\ \hline 150 \overline{) 9600} (64 \text{ days Ans.} \\ 900 \\ \hline 600 \\ 600 \end{array}$	<p>(6)</p> $\begin{array}{r} 112 \\ 20 \\ \hline 2240 \\ 6\frac{1}{2} \\ \hline 13440 \\ 560 - \frac{1}{2} \\ \hline 2000 \overline{) 14000} \\ \hline 7 \\ 28 \\ \hline 56 \\ 14 \\ \hline 16 \overline{) 196} (12\frac{1}{2} \text{ modern} \\ 16 \quad \text{[tons Ans.]} \\ \hline 36 \\ 32 \\ \hline 4 \overline{) 16} (\frac{1}{4} \end{array}$
<p>(7)</p> $\begin{array}{r} 575 \\ 100 \overline{) 200} (.2 \\ 200 \\ \hline \text{Ans. } 115.0 \text{ bushels.} \end{array}$	<p>(7)</p> $\begin{array}{r} 575 \\ 100 \overline{) 200} (.2 \\ 200 \\ \hline \text{Ans. } 115.0 \text{ bushels.} \end{array}$	<p>(7)</p> $\begin{array}{r} 575 \\ 100 \overline{) 200} (.2 \\ 200 \\ \hline \text{Ans. } 115.0 \text{ bushels.} \end{array}$

<p>(8)</p> $\begin{array}{r} 400 \\ 9 \end{array}$ <hr/> $6 00) 36 00$ <hr/> <p>Ans. 6 mo.</p>	<p>(9)</p> $\begin{array}{r} 169 \\ 25 \end{array}$ <hr/> $97) 194(2 \quad 2$ <hr/> $194 \quad 5$ <hr/> <p>Ans. \$ 10</p>	<p>(10)</p> $\begin{array}{r} \$ .33\frac{1}{3} \\ \text{or } \$ \frac{1}{3} \end{array}$ <hr/> $1.25) 1.1(0.8$ <hr/> $1.25) 11.00(8.8$ <hr/> $1000$ <hr/> $1000$ <hr/> $1000$ <hr/> <p>2.9333 &amp;c. or \$ 2.93<math>\frac{1}{3}</math> [Ans.]</p>
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## Lesson 146.

<p>(1)</p> $\begin{array}{r} 6.25) 53.00(.848 \quad .848 \\ 5000 \quad 20 \\ \hline 3000 \quad \$ 16.960 \\ 2500 \quad [Ans. \\ \hline 5000 \\ 5000 \end{array}$	<p>(2)</p> $\begin{array}{r} \frac{3}{4} \text{ of } \frac{7}{8} \\ 3 \quad 2 \\ 8 \quad 7 \\ \hline 24 \quad 14 \quad 112 \\ \frac{1}{24} \text{ or } \frac{7}{112} \end{array}$
<p>(3)</p> $\begin{array}{r} .33\frac{1}{3} \text{ or } \frac{1}{3} \\ 3 \\ \hline .75) 13.50(18 \\ 75 \quad \hline 600 \quad \$ 6 \text{ Ans.} \\ 600 \end{array}$	$\begin{array}{r} 784 \quad 19.375 \\ \frac{784}{12} \text{ lb.} \quad 12 \\ \hline 38750 \\ 19375 \\ \hline 784) 232500(.296556 \\ 1568 \quad \$ .29656 \\ \hline 7570 \quad [\text{nearly} \\ 7056 \quad \text{Ans.}] \\ \hline 5140 \\ 4704 \\ \hline 4360 \\ 3920 \\ \hline 4400 \\ 3920 \\ \hline 4800 \\ 4704 \\ \hline 96 \end{array}$
<p>(4)</p> $\begin{array}{r} 112.5 \\ 1.5 \\ \hline 5625 \\ 1125 \\ \hline \frac{3}{4} \text{ of } .75) 168.75(225 \text{ Ans.} \\ 150 \\ \hline 187 \\ 150 \\ \hline 375 \\ 375 \end{array}$	

(5)		(6)	
	$\frac{7}{8}$	13° 10' 35"	
	8) 7.0	60	
9 1.5		780	
.875	.875	10	
4575		790	360°
6405		60	60
7320			
$1\frac{3}{4}$			
or 1.75) 80.0625	(45.75	47400	21600
700	or 45 $\frac{3}{4}$ yds.	35	60
	[Ans.		
1006		47435	47435) 1296000 (27 d.
875			94870
1312			347300
1225			332045
875			15255 rem. or
875			24 [ $\frac{15255}{47435}$ d.
(7)			61020
	37		30510
.1875) .7500 (4	4		
7500			) 366120 (7 h.
Ans. 148 lbs.			332045
(8)			34075
63	42		60
2	3		
126 gals. in 1 pipe.	126 gals. in 3 tierces.		) 2044500 (43 min.
			189740
$\frac{3}{4}$ or .75) 100.00	(133333 &c.		147100
75	or $\frac{3}{4}$ 133333 $\frac{1}{3}$ Ans.		142305
250			4795
225			60
250			) 287700 (6 sec.
225			284610
25			3090

(9)			(10)		
C. ft.	T. cwt. qrs.		ft.	ft. in.	
3 5	1 5 3		7	3 2	
8	20		12 4	12	
<u>24</u>	<u>20</u>		14 $1\frac{1}{2}$	<u>36</u>	
5	5		7 $\frac{4}{4}$	2 2	
<u>29</u>	<u>25</u>		84 $2 - \frac{1}{2}$	<u>38</u> 2	
	4		6 $\frac{6}{6}$	4 $\frac{4}{4}$	
	<u>100</u>	1 cubic in.	504 cubic in.	142 cubic in.	
	3	weighs	$14\frac{1}{2}$ lbs.	140	
	<u>103</u>			<u>568</u>	
	28			142	
	<u>824</u>			504)19880(39 lbs.	
	206			1512	
	<u>2884</u>			4760	
1 lb. of	$2\frac{2}{3}$	ft. of wood.		4536	
hay buys	29			<u>224</u> rem. or	
	2000 8			16 [ $2\frac{3}{4}$ lbs.	
	<u>2884</u> <u>58000</u>	(20 — 4 ft.		<u>1344</u>	
	5768	2 C.		224	
	320) $2\frac{2}{3}$	( $\frac{1}{3}$ nearly.		)3584(7 $\frac{1}{2}$ oz.	
		Ans. 2 C. $4\frac{1}{3}$ ft. nearly.		3528	
				56) $5\frac{5}{8}$ ( $\frac{1}{8}$	

## Lesson 147.

(1)		(2)	
		A.	qrs. sq. rods.
75	97	4	2 4
4	3.5	4	
<u>300</u>	<u>485</u>	<u>16</u>	
10	291	2	
<u>8)3000</u>	<u>339.5</u>	<u>18</u>	
	9	40	
375	<u>3055.5</u>	<u>720</u>	
375)	3000	4	
		<u>724</u>	
	555	sq. rods.	
	375	to 1 bu.	
	<u>1800</u>	4344 40	
	<u>1500</u>	125)470600(3764.8(94(23	
	3000	375 360 8	
	3000	<u>956</u> <u>164</u> <u>14</u>	
		875 160 12	
		<u>810</u> <u>4.8</u> 2qrs.	
		750 [sq. rods.	
		<u>600</u>	
		500	
		<u>1000</u>	
		1000	

(3)

	gals.	qts.	pt.		gals.	qts.
	10	3	1 or .5 qt.		27	2
	4				4	
	<u>40</u>				<u>108</u>	
	3				2	
	<u>43.5</u> qts.				<u>110</u>	
\$ 16.16 $\frac{2}{3}$					16 $\frac{1}{2}$	
or \$ 16 $\frac{1}{8}$					<u>110</u>	
\$ $\frac{16\frac{1}{8}}{43.5}$ cost of 1 qt.					16	
					<u>16</u>	
					<u>1760</u>	
					183333 &c. $\frac{1}{3}$ of 110	
					<u>          </u>	
					\$	
					43.5) 1778.3333 (40.88 Ans.	
					<u>1740</u>	
					3833	
					<u>3480</u>	
					3533	
					<u>3480</u>	
					53	

(4)

cwt.	qrs.	lbs.		cwt.	qrs.	lbs.
5	3	7 $\frac{1}{2}$		6	0	18
4				4	3	
<u>20</u>				<u>10</u>	3	18
3				4		
<u>23</u>				<u>40</u>		
28				3		
<u>184</u>				<u>43</u>		
46				28		
<u>7.25</u>				<u>344</u>		
65 1.25 lbs.				86		
				18		
				<u>1222</u> lbs.		
				50		
				65 1.25) 61100.00 ( 93.819		
				<u>586125</u>		
				248750		
				<u>195375</u>		
				533750		
				<u>521000</u>		
				127500		
				<u>65125</u>		
				623750		
				<u>586125</u>		
				37625		



	(5)	(7)	chal.	bu.	pks.	bu.
	960	.25	257	15	3	or .75
	11	2000	36			
	96	500.00	1542			
	96	2000	771			
			15.75			
14)	10560	2500	9267.75			
	(754 $\frac{2}{3}$ times					
	98 [Ans.	\$ <del>8267.75</del> <sup>2500</sup> a bu.				
	76		13 $\frac{1}{2}$			
	70		36			
	60		78			
	56		39			
	2) $\frac{4}{14}$ ( $\frac{2}{7}$ )		18 — $\frac{1}{2}$ of 36			
			486			
			2500			
	4000		2430			
	58		972			
	29					
	20					
	35					
	500					
64)	4642	9267.75)1215000.00	131.099			
	(72.53125	926775	\$131.10			
	448	2882250	[Ans.			
		2780325				
	162	21759375				
	128	7253125	1019250			
			926775			
	340	94290625				
	320	\$942.91 Ans.	9247500			
			8340975			
	200					
	192		9065250			
			8340975			
	80					
	64		724275			
	160					
	128					
	320					
	320					

(8)

28)	$4\frac{1}{4}(\frac{1}{8})$	10	800	
		$2\frac{1}{2}$	.09	
		<u>7<math>\frac{3}{4}</math></u>	800	
		pun. [left.	7200	72
		7	<u>728</u>	
		3	3	

(9)

w.	d.	21	23)2184	(94.9565	94.9565
8	4	<u>2</u>	207		3
7		23			
<u>56</u>		$2\frac{3}{8}$ pun. left.	114		284.8695
4			92	Ans. \$	284.87
<u>60</u>			220		
24			207		
<u>24</u>					
12	7		130		
<u>96</u>	<u>15</u> — 1 d.		115		
96					
—	2 w.		150		
480			138		
480			120		
			115		
			<u>5</u>		

(10)

.975)	3250	(3.333 &c., or $3\frac{1}{3}$	5.46
	<u>2925</u>		$3\frac{1}{3}$
	3250		<u>1638</u>
	<u>2925</u>		182 — $\frac{1}{3}$
	325	Ans. 18.20 lbs.	

Lesson 148.

(1)

A can reap  $\frac{1}{8}$  in 1 d. B can reap  $\frac{1}{10}$  in 1 d.

$\frac{1}{8}$  and  $\frac{1}{10}$

6

10

60

A and B can reap  $\frac{10}{60}$  and  $\frac{6}{60}$  or  $\frac{16}{60}$  in 1 d. 16) 60 ( $3\frac{3}{4}$  d. Ans.

48

4)16( $\frac{3}{4}$

## RULE OF THREE.

(2)

 $\frac{1}{12}, \frac{1}{15}, \frac{1}{30}, \text{ and } \frac{1}{45}$   
 or  $\frac{15}{180}, \frac{12}{180}, \frac{6}{180}, \text{ and } \frac{4}{180}, \text{ or } \frac{37}{180}$ 
37)180(4 min.  
14832  
60)1920(51 $\frac{2}{3}$  sec.  
18570  
3733  
37

(3)

$$\begin{array}{r} 10 \quad 8 \\ 8 \quad 5 \\ \hline 2 \quad 2)40 \end{array}$$

Ans. 20 h.

(4)

$$\begin{array}{r} 4.50 \\ 1.45 \\ \hline 3.05 \\ 365 \end{array} \quad \begin{array}{r} 3000 \\ .06 \\ \hline 180.00 \end{array}$$

$$\begin{array}{r} 1525 \\ 1830 \\ 915 \end{array}$$

$$\begin{array}{r} 1113.25 \\ 180 \end{array}$$
933.253000 to pay.  
1000
$$\begin{array}{r} 933.25)4000.00(4 \text{ yrs.} \\ 373300 \end{array}$$

$$\begin{array}{r} 267.00 \text{ rem. or } \frac{267}{933.25} \text{ yr.} \\ 365 \end{array}$$

$$\begin{array}{r} 1335 \\ 1602 \\ 801 \end{array}$$

$$\begin{array}{r} )97455.00(104 \text{ d. about.} \\ 93325 \end{array}$$

$$\begin{array}{r} 413000 \\ 373300 \\ \hline 39700 \end{array}$$

(5)

The hour hand  
is 60 minutes ahead;  
the min. hand gains - - 55 min. or  $\frac{11}{12}$  h.  
[in 1 h.]

(6)  
A can mow  $\frac{1}{12}$  in 1 d. and A and B  $\frac{1}{7}$  in 1 d.

$\frac{1}{12}$  from  $\frac{1}{7}$   
11  
7  
77

or  $\frac{7}{77}$  from  $\frac{1}{12}$ , or  $\frac{4}{77}$  4)77(19  $\frac{1}{4}$  d.  
[Ans.  $\frac{37}{36}$   $\frac{1}{4}$ ]

55)60(1 h.

55  
5  
60  
300(5 min.  
275  
25  
60

1500(27  $\frac{3}{11}$  sec.  
110  
400  
385  
5)115( $\frac{3}{11}$

(7)

3.5 110  
2.7 5 50  
6.2 5 6.2 5)60.00(9 h.  
5625  
375 rem. or  $\frac{375}{60}$  h.  
60  
22500(36 min.  
1875  
3750  
3750

(8)

In 1 h. A travels  $\frac{1}{20}$  of the distance and B  $\frac{1}{30}$

or  $\frac{1}{20}$  and  $\frac{1}{30}$   
or  $\frac{3}{60}$  and  $\frac{2}{60}$ , or  $\frac{5}{60}$  5)60  
Ans. 12 h.

(9)

T. cwt. qr.  
1 2 1 The 1st farm is  $\frac{200}{250}$  of the 2d.  
20  
20  
2  
22  
4  
88  
1  
3)89  
29.66666 &c. will last 1 horse.  
7 20  
4)207.66662 ( $\frac{51}{2}$  T.  
20 40  
7 11 cwt.  
4  
3.666 &c.  
or  $3\frac{2}{3}$  qrs.

(10)

31  
200  
250)6200(24 A.  
500  
1200  
1000  
200  
4  
800(3 qrs.  
750  
50  
40  
2000(8 sq. rods.  
2000

## RULE OF THREE COMPOUND.

## Lesson 149.

(1)

$$\begin{array}{r}
 150 \\
 \underline{2} \\
 18 \overline{) 300} (16\frac{2}{3} \text{ yrs. for the in. of } 16\frac{2}{3} \\
 \underline{18} \quad [\$1 \text{ to amount to } \$1. \quad \overline{675} \text{ yrs. for the in. of } 16\frac{2}{3} \\
 120 \quad [\$675 \text{ to amount } 972 \\
 \underline{108} \quad [ \text{to } \$1. \quad 162 \\
 6 \overline{) 1\frac{2}{3}} (\frac{2}{3} \quad \underline{54} - \frac{1}{8} \\
 \quad \quad \quad \underline{54} - \frac{1}{8} \\
 \quad \quad \quad 675 \overline{) 2700} (4 \text{ yrs.} \\
 \quad \quad \quad \underline{2700} \text{ [Ans.}
 \end{array}$$

(2)

$$\begin{array}{r}
 4 \overline{) 4} \\
 \underline{4} \\
 \$1, \text{ in. of } \$200 \text{ for 1 mo.} \\
 \$15, \text{ in. of } \$200 \text{ for 15 mo.} \\
 \frac{590}{200} \text{ of } \$15, \text{ in. of } \$590 \text{ for 15 mo.} \\
 \underline{590} \\
 15 \\
 \underline{295} \\
 59 \\
 \underline{2000} 88 \overline{) 50} \\
 \text{Ans. } \$44.25
 \end{array}$$

(3)

$$\begin{array}{r}
 19 \\
 \underline{16} \\
 114 \\
 \underline{19} \\
 76 \text{ bu. will last 1 horse } 304 \text{ d.} \\
 3 \overline{) 304} \\
 \underline{304} \\
 76 \text{ bu. will last 3 horses } 101\frac{1}{3} \text{ d.} \\
 12 \text{ bu. will last 3 horses } 1\frac{2}{3} \\
 \text{of } 101\frac{1}{3} \text{ d.} \\
 101\frac{1}{3} \\
 \underline{12} \\
 202 \\
 \underline{101} \\
 4 - \frac{1}{3} \\
 76 \overline{) 1216} (16 \text{ days Ans.} \\
 \underline{76} \\
 456 \\
 \underline{456}
 \end{array}$$

(4)

cwt.	qrs.	lbs.	
14	2	17	
4			
56			
2			
58			
28			
464			
116			
17			
1641	lbs.		
\$ 1641	for 1 lb. 42 m.		
1641			
42			
3282		26	
6564		3	
68922		78	
\$ 68922	for 1 lb. 1 m.	\$ 68922	for 1 lb. 26 m.

112	
20	
2240	
6 T.	
13440	lbs.
78	
10752	
9408	\$
68922	(15.21 [Ans.
359100	
344610	
144900	
137844	
70560	
68922	
1638	

(5)

33		40	
14		24	
132			
33		80	
462		20	
5			
2310		100	
1 man can build $\frac{2310}{4}$	cubic ft. in 13 d.	7	
13		700	
4		52	
52			
1 man can build $\frac{2310}{52}$	cubic ft. in 1 d.	14	
2310		35	
7			
16170		16170)3640(0(24 d. about	
7 men can build $\frac{16170}{52}$	cubic ft. in 1 d.	3234	[Ans.
		7)406(58	

$$\begin{array}{r} (6) \\ 3 \overline{) 24} \end{array}$$

The rice is  $\overline{8}$  cts. a lb.

$$\begin{array}{r} 12 \\ 8 \end{array}$$

$$5 \overline{) 96}$$

The coffee is  $\overline{19.2}$  cts. a lb.

$$\begin{array}{r} 78 \\ \hline 1536 \\ 1344 \\ \hline 14976 \end{array}$$

Ans. \$14.98

### Lesson 150.

(1)

$$\begin{array}{r} 8 \\ 6 \\ \hline \end{array}$$

48 h.  
7 men.

1 man in 336 h. could hoe 21 A.

$$\begin{array}{r} 4 \\ 21 \overline{) 336} \end{array}$$

16 h. for 1 man to hoe 1 A.

$$\begin{array}{r} 21 \text{ —} \\ \text{—} 4 \text{ h. for 4 men to hoe 1 A.} \\ 126 \\ 126 \end{array}$$

16.5

4

11) 66.0 h. for 4 men to hoe  
[16½ A.

Ans. 6 days.

(2)

$$\begin{array}{r} \frac{3}{4} \\ \frac{2}{5} \end{array}$$

3 4  
5 2

15 8  
1½ d. for 12 men to load  
[1 vessel.

15

12

30

15

180

18½ d. for 1 man.

5) 180

36

¾ d. for 5 men.

36

3

8) 108

Ans. 13½ d. for 5 men to load  
[3 vessels.

(3)

15) 75 (5 d. 1 bu. lasts 12 men.

75

12

5

3) 0) 6) 0 d. 1 bu. lasts 1 man.

2 d. 1 bu. lasts 30 men.

45

10

8

Ans. 90 d. 45 bu. last 30 men.

(4)

32 w. 7	20 w. 7		
224 d. 32 oz.	140 32		
448	28		
672	42		
7168	4480		
400	400		
2867200 oz.	1792000 oz. used in 20 w.	400	30 w.
1792000	The remaining provisions are to last	50	7
1075200 oz. remaining.			
210)1075200(5120 oz. for 350 men in a day.	350)5120(14 $\frac{2}{3}$ oz.		
105	350		[Ans.
252	1620		
210	1400		
420			
420			
0			

(5)

$\frac{1}{8}$ of $\frac{3}{4}$			
8	3		
4	5		
32	15		
$1\frac{1}{2}$ sq. yds. cost \$ $2\frac{1}{4}$ or \$ $\frac{9}{4}$		$4\frac{3}{8}$ times \$ $2\frac{8}{60}$	
15	32	8	288
4	9	60	49
60	288	480	2592
1 sq. yd. cost \$ $2\frac{8}{60}$			1152
$3\frac{1}{2}$ or $\frac{7}{2}$ of $1\frac{3}{4}$ or $\frac{7}{4}$			\$
2	7	480)14112(29.40	Ans.
4	7	960	
8	49		
$4\frac{3}{8}$ sq. yd. in 2d piece.			
		4512	
		4320	
		1920	
		1920	



$$\begin{array}{r} (6) \quad .75 \\ \quad .8 \\ \hline \end{array}$$

\$ $\frac{15.50}{.875}$  cost of 1 load. .600 as much in the 2d quantity as [in the 1st load.]

$$\begin{array}{r} 15.50 \\ \quad .6 \\ \hline .875) 9.300 ( 10.628 \\ \quad 875 \quad \$10.63 \\ \hline \quad 5500 \quad [\text{Ans.}] \\ \quad 5250 \\ \hline \quad 2500 \\ \quad 1750 \\ \hline \quad 7500 \\ \quad 7000 \\ \hline \quad 500 \end{array}$$

$$\begin{array}{r} (7) \\ 3) 21 \\ \hline \$7 \text{ price of 1 man 6 d.} \end{array}$$

$$\begin{array}{r} 6) 7 \\ \hline 1.1666 \text{ \&c.} \end{array}$$

or \$1.16 $\frac{2}{3}$  price of 1 man 1 d.  
15

$$\begin{array}{r} 580 \\ 116 \\ \hline 5 - \frac{1}{3} \\ 5 - \frac{1}{3} \end{array}$$

\$17.50 price of 1 man 15 d.

$$\begin{array}{r} 17.50) 157.50 (9 \text{ Ans.} \\ \underline{157.50} \end{array}$$

## CHAIN RULE.

## Lesson 151.

(3)	(4)	(5)
$\begin{array}{r} 8 \\ 15 \\ \hline 40 \\ 8 \\ \hline 120 \\ 20 \\ \hline 2400 \end{array}$	$\begin{array}{r} 6 \\ 16 \\ \hline 36 \\ 6 \\ \hline 96 \\ 30 \\ \hline 2880 \\ 40 \\ \hline 115200 (48 \\ 96 \quad [\text{Ans.}] \\ \hline 192 \\ 192 \end{array}$	$\begin{array}{r} 25 \\ 31 \\ \hline 25 \\ 75 \\ \hline 775 \\ 16 \\ \hline 4650 \\ 775 \\ \hline 12400 (40 \\ 134 \quad [\text{Ans.}] \\ \hline 0 \end{array}$
$\begin{array}{r} 12 \\ 15 \\ \hline 60 \\ 12 \\ \hline 180 \\ 50 \\ \hline 9000 (36 \\ 75 \quad [\text{Ans.}] \\ \hline 150 \\ 150 \end{array}$		

BARTER.

Lesson 152.

(6)

C.	ft.
19	7
8) 7.0	
<u>19.875</u> C.	
6	
3) 119.250	
quintals	<u>39.75</u>
	112
	<u>150</u>
	75
	<u>75</u>
lbs.	84.00

(8)

.125 or  $\frac{1}{8}$

4.75

8

Ans. 38.00 lbs.

(11)

$\frac{7}{8}$	5
	7
<u>6) 35</u>	
<u>\$ 5.83<math>\frac{1}{2}</math></u> a C.	
	12
	<u>6</u>
5) 72 (14 C.	
	<u>5</u>
	22
	<u>20</u>
	2
	or $\frac{2}{5}$ of a C.
	8
<u>16 (3.2 ft.</u>	
	<u>15</u>
	10

(7)

4.3125
<u>12</u>
86250
<u>43125</u>
.4166 &c.) 51.75000 (124.2 bu. Ans.
4166
<u>10083</u>
8333
<u>17500</u>
16666
<u>8333</u>
8333

In this sum we proceed as if the decimals 66 &c. were carried out to a great extent, thus; .41666666. Take a similar course in like cases.

(9)

$\frac{36}{30}$	15
	<u>36</u>
	90
	<u>45</u>
30)	<u>540</u>

Ans. 18 cents a doz.

(12)

cwt.	qrs.	lbs.
7	3	16.8
<u>4</u>		
28		
<u>3</u>		
31		
<u>28</u>		
248		
<u>62</u>		
16.8		
<u>884.8 lbs.</u>		

(10)

.42	
<u>80</u>	
33.60	
<u>15</u>	
.08) 18.60	
	<u>232.5</u>
	or 232 $\frac{1}{2}$ lbs.
	[Ans.

553	
<u>20</u>	
884.8) 11060 (12.5	
8848	12 $\frac{1}{2}$ cts.
<u>22120</u>	Ans.
17696	
<u>44240</u>	
44240	

## ASSESSMENT OF TAXES.

## Lesson 153.

(1)

2368.07  
939.81  
2500.

---

6)5807.88

---

\$967.98 whole poll tax.

663)967.98 ( 1.46  
663 2 polls.

---

3049 \$2.92 tax on 2 polls.  
2652

---

3978  
3978

5807.88  
967.98

4373  
813

---

~~4839.80~~ tax on \$1    4839.90 tax on estates.    5186 whole estate.  
3540.00    5186

290394  
387192  
48399  
241995

354000)250997214 ( 70.90 tax on estate.  
2478000 2.92 tax on 2 polls.

---

3197214 \$73.82 Ans.  
3186000

---

112140

(2)

1.46 tax on 1 poll.    ~~4839.80~~ tax on \$1.    4839.9  
3    3540.00    2175

---

4.38 tax on 3 polls.

---

241995  
338793  
48399  
96798

---

10526782.5  
(Carried over.)

1000  
1175  
2175 whole  
[estate.]

(Brought over.)

354000) 10526782.5 (29.736 29.74  
 708000 4.38

3446782 Ans. \$ 34.12  
 3186000

2607825  
 2478000

(4)  
 128640

.03 211  
 1.20

1298250  
 1062000

38.592

1286.40 422 2362500  
 211 2124000

1324.992  
 253.20 253.20 tax 238500  
 [on polls.

1071.792 tax on estates.

\$

117273) 1071.792 (.0091392 tax on \$1 about.  
 1055457

The tax paid by

163350  
 117273

\$	\$	\$	\$
1 is .009	by 60 is .548		
2 " .018	70 " .64		
3 " .027	80 " .731		
4 " .037	90 " .823		
5 " .046	100 " .914		
6 " .055	200 " 1.828		
7 " .064	300 " 2.742		
8 " .073	400 " 3.656		
9 " .082	500 " 4.569		
10 " .091	600 " 5.484		
20 " .183	700 " 6.398		
30 " .274	800 " 7.311		
40 " .366	900 " 8.225		
50 " .457	1,000 " 9.139		

460770

351819

1089510

1055457

340530

234546

1059840

1055457

1583

275

4383

\$ 1858

The tax on \$1,000 is 9.139

" " 800 " 7.311

" " 50 " .457

" " 8 " .073

16.980

1.20 poll tax.

Ans. \$ 18.18

## SIMPLE FELLOWSHIP.

## Lesson 154.

(1)

1000  
1250

2250) 9450 (.42  
9000  
4500  
4500

.42  
1000  
\$420.00 A's gain.

1250  
.42  
250  
500

(2)

420  
525

\$945 proof.

\$525.00 B's gain.

(3)

2500  
2200  
12000

16700) 65000 (.3892215  
50100

149000  
133600

154000  
150300

37000  
33400

36000  
33400

26000  
16700

93000  
83500

9500

.3892215  
2500

19461075  
7784430

973.0537500

\$973.05 Wallace's [share.]

.3892215  
2200

7784430  
7784430

856.2873000

\$856.29 Clark's [share.]

.3892215  
12000

7784430  
3892215

4670.6580000

\$4,670.66 Shaw's share.

(4)

950			
800			
1750	3000	(.171428	.171428
1750		950	.171428
12500		857140	800
12250		1542852	137142400
2500		162856600	
1750		\$162.86 A's	\$137.14 B's
7500		[share.	[share.
7000			
5000			
3500		950	800
15000		162.86	132.14
14000		\$787.14 A	\$667.86 B
1000		[saved.	[saved.

(5)

(6)

A paid  $\frac{2}{3}$  of his own payment, and B  $\frac{1}{3}$  as much.  
Both paid  $\frac{1}{3}$  as much as A.

14)1540(110 is $\frac{1}{3}$	110	110
14	9	5
14	A's \$990	B's \$550
14		
0		

(7)

5000			
3000			
2500			
10500	14950	(1.4238095	1.4238095
10500		5000	3000
44500		7119.0475000	4271.4285000
42000		\$7,119.05 son's	\$4,271.43 oldest
25000		[share.	[daughter's share.
21000			
40000		1.4238095	
31500		2500	
85000		7119.0475	
84000		2847.6190	
100000		3559.5237500	
94500		3,559.52 youngest daughter's	
55000		[share.	
52500			
2500			

## COMPOUND FELLOWSHIP.

$$\begin{array}{r}
 \text{(8)} \\
 2825.16 \\
 \underline{275.16} \\
 80) 2550.00 \\
 \underline{31875} \\
 2
 \end{array}$$

Ans. \$ 63.75 0

$$\begin{array}{r}
 \text{(9)} \\
 80) 1000 \\
 \underline{125} \\
 2 \\
 \text{Ans. \$ 25.0}
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 14000) 5600.0 \text{ (.4)} \quad 5000 \quad 2000 \quad 3000 \quad 4000 \\
 \underline{56000} \quad .4 \quad .4 \quad .4 \quad .4 \\
 \$2000.0 \quad \$800.0 \quad \$1200.0 \quad \$1600.0 \\
 \text{[A's share.]} \quad \text{[B's.]} \quad \text{[C's.]} \quad \text{[D's.]}
 \end{array}$$

## COMPOUND FELLOWSHIP.

## Lesson 155.

$$\begin{array}{r}
 \text{(1)} \\
 \begin{array}{r}
 400 \\
 6 \\
 \hline
 2400
 \end{array}
 \quad
 \begin{array}{r}
 450 \\
 8 \\
 \hline
 3600
 \end{array} \\
 2400 \\
 3600 \\
 \hline
 6000) 12000 \text{ (.02)} \\
 \underline{12000} \\
 \$48.00 \text{ A's} \quad \$72.00 \quad \$120 \text{ proof.} \\
 \text{[share.]} \quad \text{[B's share.]}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 \begin{array}{r}
 2000 \\
 7 \\
 \hline
 14000
 \end{array}
 \quad
 \begin{array}{r}
 3000 \\
 5 \\
 \hline
 15000
 \end{array}
 \quad
 \begin{array}{r}
 4000 \\
 4 \\
 \hline
 16000
 \end{array} \\
 14000 \\
 15000 \\
 16000 \\
 \hline
 45000) 15000 \text{ (.0333 \&c.)} \\
 \underline{135} \text{ or } .03\frac{1}{3} \\
 150 \\
 135 \\
 \hline
 15 \\
 \text{(Carried over.)}
 \end{array}$$

(Brought over.)

14000	15000	16000
.03 $\frac{1}{2}$	.03 $\frac{1}{2}$	.03 $\frac{1}{2}$
<hr/>	<hr/>	<hr/>
420.00	450.00	480.00
46.666	50	53.333
<hr/>	<hr/>	<hr/>
466.666	\$500 Adams's	533.333
\$466.67 Jones's share.	[share.]	\$533.33 Stevens's
		[share.]

(4)

3000	1000	500
12	9	4
<hr/>	<hr/>	<hr/>
36000	9000	2000
	36000	36000
	<hr/>	<hr/>
	A 45000	B 38000
	45000	
	38000	
	<hr/>	
	83000	\$ $\frac{2000}{33000}$ for \$1.

45000	38000
2000	2000
<hr/>	<hr/>
83 000)90000 000(1084.337	83 000)76000 000(915.66 B's
83	747
\$1,084.34 A's divi-	[dividend.]

700	130
664	83
<hr/>	<hr/>
360	470
332	415
<hr/>	<hr/>
280	550
249	498
<hr/>	<hr/>
310	520
249	498
<hr/>	<hr/>
610	22
581	
<hr/>	
29	

(5)

6 4)4
.5
<hr/>
1
3.0
1
<hr/>
4)36
<hr/>
9 3
9

A \$27 B \$9



## COMPOUND FELLOWSHIP.

		(6)	
A 12		9	$\frac{1}{2}$ of $\frac{3}{4}$
		3	or $\frac{1}{2}$ or $\frac{3}{4}$
		4)27	
		B 6.75	6
			3
12			5)18
6.75			C 3.6
3.6		12	
<u>22.35</u>		3000	
\$ 22.35 for 1	2235)	36000.00	(1610738
		2235	\$ 1,610.74 A's share.
		13650	
		13410	
		<u>2400</u>	
		2235	
		<u>16500</u>	
		15645	
		<u>8550</u>	
		6705	
		<u>18450</u>	
		18080	
		<u>370</u>	
6.75			3.6
3000			3000
2235) 20250.00	(906.04 B's	2235) 10800.00	(483.22
20115	[share.	8940	[C's share.
<u>13500</u>		<u>18600</u>	
13410		17880	
<u>9000</u>		<u>7200</u>	
8940		6705	
<u>60</u>		<u>4950</u>	
		4470	
		<u>4800</u>	
		4470	
		<u>330</u>	

(7)			
5000	5000	3000	3000
<u>4</u>	<u>3000</u>	<u>5</u>	<u>4000</u>
20000	2000	15000	7000
<u>12000</u>	<u>6</u>	<u>21000</u>	<u>3</u>
A 32000	12000	B 36000	21000
32 000			
36 000			
<u>68 000</u>	68)1768(26	26	26
	136	<u>32</u>	<u>36</u>
	408	52	156
	<u>408</u>	<u>78</u>	<u>78</u>
		\$ 832	\$ 936
		A's share.	B's share.

## INSURANCE.

## Lesson 157.

(1)		(2)	
3800		2000	5000
.01		<u>5</u>	<u>.02</u>
<u>38.00</u>	$\frac{5000}{8000}$ or $\frac{5}{8}$ of the brig	8)10000	100.00
2	[is insured.]	<u>1250</u>	
<u>3)76</u>		<u>100</u>	
Ans. \$ 25.33 $\frac{1}{3}$		Ans. \$ 1,150	

(3)		(4)	
5000)37500(.0075 or .75 per cent. Ans.		.03	
<u>3500</u>		.04	
2500		<u>.06</u>	
<u>2500</u>		.13	
		<u>9000</u>	
		Ans. \$ 1,170.00	

1.00 (6)  
.05

.95) 8000.00 ( 8421.05  
 760 .05

400      421.0525      8421.05  
 380      \$421.05 Ans.      421.05

200  
 190      \$8000.00 proof.

100 (7)  
 95      10000  
500      .04

475      Ans. \$4000.00 prem.      10000  
25      400

[ered.  
 \$9600 sum cov-

.03 (8)  
.0025  
.005  
.0375

1.00  
.0375

.9625) 8000.0000 ( 8311.688  
 77000 .03

30000      24935064  
 28875      \$249.35 Ans.

11250  
 9625

16250  
 9625

66250  
 57750

85000  
 77000

80000  
 77000

3000

(9)  
 .01) 88.10

\$8,810 sum insured.  
 88.10

\$8721.70 sum.  
 covered.

## GENERAL AVERAGE.

## Lesson 159.

(1)

61000) 3237.00 ( .0530655 to be paid  
305000 by \$1

.0530655  
16000

187000  
183000

3183930  
530655

400000  
366000

849.0480000

\$849.05

340000  
305000

L. Murdock.

350000  
305000

45000

.0530655  
8250

.0530655  
15000

.0530655  
11000

2653275  
1061310  
4245240

2653275  
530655

530655  
530655

437.7903750

795.9825000

583.7205000

\$437.79

\$795.98

\$583.72

John Williams.

Daniel Drake.

T. Jones.

.0530655  
10750

Proof.

2653275  
3714585  
530655

849.05  
437.79  
795.98  
583.72  
570.46

570.4541250

3,237.00

570.45

Add 1 to balance frac-  
\$570.46 [tions lost.

S. Hyde.

(2)		
10000 vessel.	7000	3) 1050
<u>1350</u>	<u>.03</u>	<u>350 — <math>\frac{1}{3}</math> of freight.</u>
8650	21000 premium.	<u>2</u>
<u>700</u>	1140 - - damage.	<u>700 — <math>\frac{2}{3}</math></u>
9350	1350	
9000 A's goods.	5000 B's goods.	12800 C's goods.
<u>.02<math>\frac{1}{2}</math></u>	<u>.02<math>\frac{1}{2}</math></u>	<u>.02<math>\frac{1}{2}</math></u>
18000	10000	25600
<u>4500</u>	<u>2500</u>	<u>6400</u>
225.00 premium.	125.00 premium.	320.00 premium.
300 - damage.	319 - freight.	586.50 damage.
300 - freight.	<u>444</u>	256 - freight.
<u>825</u>	5000	<u>1162.50</u>
9000	<u>444</u>	12800
<u>825</u>	4556	<u>1162.50</u>
8175		11637.50,

8750 C's goods.	9350	
<u>02<math>\frac{1}{2}</math></u>	8175	
17500	4556	
4375	11637.50	
218.75 premium.	8356.25	
175 - freight.	42074.75)	378.67000 ( .009 to be
<u>393.75</u>		37867275 [paid by \$1

8750  
393.75  
8356.25

9350	8175	4556	11637.5	8356.25
.009	.009	.009	.009	.009
<u>\$84.150</u>	<u>73.575</u>	<u>41.004</u>	<u>104.7375</u>	<u>75.20625</u>
Owner of the	\$73.57	\$41	\$104.74	\$75.21
[barque.	A	B	C	D

Proof.  
84.15  
73.57  
41  
104.74  
75.21  
\$378.67

ALLIGATION MEDIAL.

Lesson 160.

(1)

	.80	1	1.30	1.40
	4	6	8	10
	<u>3.20</u>	<u>6</u>	<u>10.40</u>	<u>14.00</u>
4	3.20			
6	6.			
8	10.40			
10	14.			
<u>28</u>	<u>33.60</u>			

28 28) 33.60 (1.20 Ans.

28  
56

(2)

	200	400	500
	.06	.08	.10
	<u>12.00</u>	<u>32.00</u>	<u>50.00</u>
200	12		
400	32		
500	50		
<u>1100</u>	<u>94</u>		

11) 94 (8.545 Ans. \$ 8.55

88  
60  
55  
50  
44  
60  
55  
5

(4)

18	19	24
9	10	7
<u>162</u>	<u>190</u>	<u>168</u>

(3)  
100) 08.55

\$ .0855 or 8½ cts.  
[about Ans.

9 162  
10 190  
7 168  
26 26) 520 (20 Ans.  
52  
0

(5)				(6)			
		lb.	oz.				
	18	2	10	24		1	
	11	12		8		60	
	—	—		—		—	
	18	24		192		60	
	18	10				.15	
	—	—				—	
	198	34 oz.				30	
	—	—				6	
11	198	20				—	
34	680	680		60		9.00	
8	192			15		60	
3	—			—		—	
—	—			75	75)	69.0	Ans.
56	56)	1070	(19 $\frac{3}{8}$ Ans.			675	
	—	56				—	
		510				150	
		504				150	
		—				—	
		2) $\frac{6}{88}$ ( $\frac{3}{8}$					
(9)				(7)			
	lbs.	oz.	oz.	pwt.			
	5	3	10	1			
	12			20)	1		
	—			—	—		
	60				10.05	oz.	
	3					[fine.	
	63	oz.		12			
	10.05			3 lbs.			
	—			36	oz.		
	315			12			
	63			72			
	36			36			
	9			—			
	108	108)	1065.15	(9 oz.	432		
			972				
			—				
			93.15				
			20				
10)10	12)9.0	(.75	20)15		1863.00	(17 pwts.	
—	—	84	—		108		
	1	—	.25		—		
		60			783		
	1.				756		
10	.75		(8)		27		
9	.25		12		24		
5	—		1		—		
—	2.00		—		108		
24	$\frac{2}{4}$ or $\frac{1}{2}$		11 oz. fine.		54		
	[Ans.				—		
					648	(6 grs.	
					648		

# ALLIGATION ALTERNATE.

## Lesson 161.

<p>(2)</p> $\begin{array}{r} 50 \\ 45 \\ \hline 5 \end{array}$	<p>(3)</p> $\begin{array}{r} 62 \\ 50 \\ \hline 12 \end{array}$	<p>(3)</p> $\begin{array}{r} 20 \\ 19 \\ \hline 1 \end{array}$	$\begin{array}{r} 19 \\ 17 \\ \hline 2 \end{array}$
<p>Ans. 12 at 45 cts., and 5 at 62 cts.</p>		<p>Ans. 2 oz. 20 carats fine, and 1 oz. 17 carats fine.</p>	

<p>(4)</p> $\begin{array}{r} 15 \\ 10 \\ \hline 5 \\ 120 \end{array}$	<p>(5)</p> $\begin{array}{r} 10 \\ 8 \\ \hline 2 \\ 120 \end{array}$	<p>(5)</p> $\begin{array}{r} 2 \\ 1\frac{1}{2} \\ \hline \frac{1}{2} \end{array}$	$\begin{array}{r} 1\frac{1}{2} \\ 0 \\ \hline 1\frac{1}{2} \end{array}$
<p>changing to a common denominator, <math>\frac{1}{8}, \frac{1}{16},</math> and <math>\frac{1}{12}</math>  <math>\frac{15}{120}, \frac{10}{120},</math> and <math>\frac{10}{120}</math></p>		<p>Ans. <math>1\frac{1}{2}</math> of rum to <math>\frac{1}{2}</math> of water,  or multiplying both numbers  by 2, 3 of rum to 1 of water.</p>	
<p>Ans. in the proportion of <math>\frac{2}{120}</math> to <math>\frac{5}{120}</math>  changing to a simpler form, <math>\frac{1}{60}</math> to <math>\frac{1}{24}</math>  multiplying both numbers by 120, 2 to 5</p>			

<p>(6)</p> $\begin{array}{r} 23 \\ 20 \\ \hline 3 \end{array}$	$\begin{array}{r} 20 \\ 0 \\ \hline 20 \end{array}$	<p>(7)</p> $\begin{array}{r} 10 \\ 5 \\ \hline 5 \end{array}$	$\begin{array}{r} 23 \\ 10 \\ \hline 13 \end{array}$
<p>Ans. 20 of gold to 3 of alloy.</p>		<p>Ans. 13 oz. of 5 per cent. copper,  and 5 oz. of 23 per cent. copper.</p>	

## Lesson 162.

<p>(2)</p> $\begin{array}{r} 20 \\ 16 \\ \hline 4 \end{array}$	<p>(3)</p> $\begin{array}{r} 23 \\ 20 \\ \hline 3 \end{array}$	<p>(3)</p> $\begin{array}{r} 45 \\ 40 \\ \hline 5 \end{array}$	$\begin{array}{r} 40 \\ 36 \\ \hline 4 \end{array}$
<p>3 of 16 and 4 of 23</p>		<p>4 of <math>\frac{1}{3}</math> alloy and 5 of <math>\frac{1}{10}</math></p>	
$\begin{array}{r} 20 \\ 18 \\ \hline 2 \end{array}$	$\begin{array}{r} 23 \\ 20 \\ \hline 3 \end{array}$	$\begin{array}{r} 45 \\ 40 \\ \hline 5 \end{array}$	$\begin{array}{r} 40 \\ 30 \\ \hline 10 \end{array}$
<p>3 of 18 and 2 of 23</p>		<p>10 of <math>\frac{1}{3}</math> alloy and 5 of <math>\frac{1}{12}</math></p>	
$\begin{array}{r} 20 \\ 19 \\ \hline 1 \end{array}$	$\begin{array}{r} 23 \\ 20 \\ \hline 3 \end{array}$		
<p>3 of 19 and 1 of 23</p>			



(4)		(5)	
24	22	280	175
22	17	175	160
<hr/>	<hr/>	<hr/>	<hr/>
2	5	105	15
5 of 24 carats with 2 of 17		15 at \$ 2.80 and 105 at \$ 1.60	
24	22	210	175
22	20	175	150
<hr/>	<hr/>	<hr/>	<hr/>
2	2	35	25
2 of 24 carats with 2 of 20		25 at \$ 2.10 and 35 at \$ 1.50	

## Lesson 163.

(1)		(2)	
100	112	23½	20
80	100	20	18
<hr/>	<hr/>	<hr/>	<hr/>
20	12	3½	2
12 at 80 and 20 at 112		2 at 23½ and 3½ at 18	
100	112	20	21
90	100	19	20
<hr/>	<hr/>	<hr/>	<hr/>
10	12	1	1
12 at 90 and 10 at 112		1 at 19 and 1 at 21	
Both mixtures; 12 at 80, 12 at 90, [and 30 at 112		2)8	
12)30(2.5 times that at 80 to make		<hr/>	4 times that at 23½ to make
24	[30 bu.		[8 oz.
<hr/>			<hr/>
60			3½
60			4
<hr/>			<hr/>
12	12	4	12
2.5	2.5	2	2 — ½
<hr/>	<hr/>	<hr/>	<hr/>
60	60		8 oz. at 23½ carats, 14 oz. at 18
24	24		carats, 4 oz. at 19 carats, and
<hr/>	<hr/>		4 oz. at 21 carats, Ans.
30.0 bu. at	30.0 bu. at	75.0 bu. at	
[80 cts.	[90 cts.	[112 cts. Ans.	

(3)

$$\begin{array}{r} 3 \\ 1\frac{1}{2} \\ 1\frac{1}{2} \\ \hline 1\frac{1}{2} \text{ at } 3 \text{ and } 1\frac{1}{2} \text{ at } 0 \end{array}$$

$$\begin{array}{r} 1\frac{1}{2} \\ 0 \\ \hline 1\frac{1}{2} \end{array}$$

$$\begin{array}{r} 2 \\ 1\frac{1}{2} \\ \frac{1}{2} \\ \hline 1\frac{1}{2} \text{ at } 2 \text{ and } \frac{1}{2} \text{ at } 0 \end{array}$$

$$\begin{array}{r} 1\frac{1}{2} \\ 0 \\ \hline 1\frac{1}{2} \end{array}$$

Both mixtures;  $1\frac{1}{2}$  at 3,  $1\frac{1}{2}$  at 2, and 2 at 0

$$2)10 \quad \frac{5}{5} \text{ times that at 0 to make 10 gals.}$$

$$\begin{array}{r} 1\frac{1}{2} \\ 5 \\ \hline 5 \\ 2\frac{1}{2} - \frac{1}{2} \\ \hline \text{Ans. } 7\frac{1}{2} \text{ gals. at } \$3 \text{ and } 7\frac{1}{2} \text{ gals. at } \$2, \text{ with } 10 \text{ gals. at } \$0 \end{array}$$

$$\begin{array}{r} (4) \\ 15 \quad 15 \quad 6 \\ 5 \quad 10 \quad 5 \\ \hline 20 \quad 2)0 \quad 180 \\ \hline 9 \text{ cts. a lb.} \end{array}$$

$$\begin{array}{r} 10 \quad 11 \\ 9 \quad 10 \\ \hline 1 \quad 1 \\ 1 \text{ at } 9 \text{ and } 1 \text{ at } 11 \\ 10 \quad 15 \\ 9 \quad 10 \\ \hline 1 \quad 5 \\ 5 \text{ at } 9 \text{ and } 1 \text{ at } 15 \end{array}$$

Both mixtures; 6 at 9, 1 at 11, and [1 at 15

$$6)20 \quad \frac{3\frac{1}{3}}{3\frac{1}{3}} \text{ times that at 9 to make } 20 \text{ [lbs.}$$

$$\begin{array}{r} 6 \\ 3\frac{1}{3} \\ \hline 18 \\ 2 - \frac{1}{2} \\ \hline 20 \text{ lbs. at } 9 \text{ cts., } 3\frac{1}{3} \text{ lbs. at } 11 \text{ cts.,} \\ \text{[and } 3\frac{1}{3} \text{ lbs. at } 15 \text{ cts., Ans.} \end{array}$$

$$\begin{array}{r} 2 \\ 5 \\ \hline 5 \end{array}$$

(5)

$$\begin{array}{r} 16 \quad 22 \\ 6 \quad 10 \\ \hline 96 \quad 220 \end{array}$$

$$\begin{array}{r} 6 \quad 96 \\ 10 \quad 220 \\ \hline 16 \quad 16)316(19\frac{3}{4} \text{ carats.} \end{array}$$

$$\begin{array}{r} 16 \\ 156 \\ 144 \\ \hline 4)1\frac{2}{3}( \frac{3}{4} \end{array}$$

$$\begin{array}{r} 20 \quad 21 \\ 19\frac{3}{4} \quad 20 \\ \hline \frac{1}{4} \quad 1 \end{array}$$

1 at  $19\frac{3}{4}$  and  $\frac{1}{4}$  at 21

16 times that at  $19\frac{3}{4}$  to make 16 [lbs.

$$\begin{array}{r} 4)16 \\ 16 \text{ oz. at } 19\frac{3}{4} \text{ carats. } 4 \text{ oz. at } 21 \\ \text{[carats, Ans.} \end{array}$$

(6)

	10	oz.	pwts.	oz.	pwts.
	8	9	14	11	10
	<hr/>				
	80	20	14	20	10
			<hr/>		<hr/>
			9.7 oz. fine.		1 1.5 oz. fine.
8	80		10		2
10	97				
2	23		<hr/>		<hr/>
			97.0		23.0
<hr/>					
20	20	oz.	pwts.		
	20	11	4		
	<hr/>				
	10	20	14		
			<hr/>		
			1 1.2 oz. fine.		

11	11.2	11	12
10	11	10	11
<hr/>		<hr/>	
1	.2	1	1
.2 at 10 and 1 at 11.2		1 at 10 and 1 at 12	

Both mixtures; 1.2 at 10, 1 at 11.2, and 1 at 12

1.2) 20.0 (1 6.6 6 6 &c. or  $16\frac{2}{3}$  times that at 10 to make 20 ounces; and of course  $16\frac{2}{3}$  oz. at 11.2 oz. or 11 oz. 4 pwts. fine, and  $16\frac{2}{3}$  oz. of pure silver, Ans.

$$\begin{array}{r}
 80 \\
 72 \\
 \hline
 80 \\
 72 \\
 \hline
 8
 \end{array}$$

(7)

50	60	50	70
40	50	40	50
<hr/>		<hr/>	
10	10	10	20
10 at 40 and 10 at 60		20 at 40 and 10 at 70	

Both mixtures; 30 at 40, 10 at 60, and 10 at 70.

$$\begin{array}{r}
 30 \\
 10 \\
 10 \\
 \hline
 50
 \end{array}
 \begin{array}{r}
 40.0 \\
 (.8 \text{ times each make } 40) \\
 40.0
 \end{array}$$

30	10	10
.8	.8	.8
<hr/>	<hr/>	<hr/>
Ans. 24.0 bu. at 40 cts.,	8.0 at 60 cts.,	and 8.0 at 70 cts.

(8)

21	23
<u>18½</u>	<u>21</u>
2½	2

2 at 18½ and 2½ at 23

21	23
<u>20</u>	<u>21</u>
1	2

2 at 20 and 1 at 23

Both mixtures; 2 at 18½, 2 at 20,  
[and 3½ at 23

2	
<u>2</u>	
3½	
<u>7½</u>	12
or 1½	<u>2</u>

15)24(1.6 times each to  
15 [make 12 oz.

90	
<u>90</u>	

2	2	3.5
<u>1.6</u>	<u>1.6</u>	<u>1.6</u>
12	12	210
<u>2</u>	<u>2</u>	<u>35</u>

3.2 or 3½ 3.2 or 3½ 5.6 or 5¾  
3½ oz. 18½, 3½ oz. 20, and 5¾ oz.  
[23 carats, Ans.

(9)

3	1¾
<u>1¾</u>	<u>0</u>
1¾	1¾

1¾ at 3 and 1¾ at 0

2	1¾
<u>1¾</u>	<u>1¾ or 1¾</u>
¼	¼

¼ at 2 and ¼ at 1½

1¾ or ¾
<u>1¾ or ¾</u>
¼
<u>¼</u>
¾ or ¾ or ¾

dividing 20 by ¾

2
<u>40</u>

40 times each to make 20

40 times ¾
7 7
<u>4 40</u>
28 280
<u>280</u>

28)280(10 gals. at  
[ \$ 3.

40 times ¾
7 5
<u>4 40</u>
28 200
<u>200</u>

28)200(7½ gals. of  
196 [water.

<u>4</u>
28 or 7

40 times ¾

7 1
<u>4 40</u>
28 40
<u>40</u>

28)40(1½ gal. at \$2  
28 and 1½ gal.  
— at \$1½.

4)1½(¾

## PROMISCUOUS QUESTIONS

IN

RULE OF THREE, FELLOWSHIP, INSURANCE, &amp;c.

## Lesson 165.

(1)

1.00

.04

 $.96) 5000.00$  (5208.3333 &c.

480 Ans. I must insure

\$5,208.33  $\frac{1}{2}$ 

200

192

800

768

320

288

320

288

32

(3)

8)0 350

\$4375 a thousand.

33

13125

13125

144375

Ans. \$14437  $\frac{1}{2}$ 

(4)

8

7

1 man can do it in 56 days.

14)56(4 Ans.

56

(5)

The rice is bartered at  $\frac{5}{4}$  its value.

1

5

4)5

Ans. \$1.25

5208.333 &amp;c.

.04

208.3333 &amp;c.

\$208.33  $\frac{1}{2}$  premium.

(2)

\$ $\frac{2.20}{80}$  for the use of \$1,  
[9 mo.

80

9

720

\$ $\frac{2.20}{720}$  for the use of \$1,  
[1 mo.

390

11

39

39

4290

\$ $\frac{42.90}{4290}$  for the use of \$1,  
[11 mo.

4290

375

2145

3003

1287

\$

720)16087.50 (22.34 Ans.

1440

1687

1440

2475

2160

3150

2880

270

(6)  
 $1\frac{3}{4}$  time  $6\frac{3}{8}$   
 or  $\frac{7}{4}$  time  $5\frac{1}{8}$   
 $\begin{array}{r} 4 \quad 51 \\ 8 \quad 7 \\ \hline 32 \quad 357 \end{array}$   
 $\frac{357}{32}$  sq. yds. in 1st piece.  $25.50$   
 $\quad \quad \quad 32$

$$\begin{array}{r} 510 \\ 765 \\ \hline 816.0 \\ \$ \frac{816}{367} \text{ a sq. yd.; divide by } \frac{55}{8} \text{ sq. yds. in 2d piece.} \\ 357 \\ 8 \\ \hline 2856 \end{array}$$

(7)  
 $10) 1859$   
 $\begin{array}{r} 185.9 \\ 6 \\ \hline \end{array}$   
 $\begin{array}{r} 185.9 \\ 4 \\ \hline \end{array}$   
 A's \$1,115.40, B's \$743.60  
 [Ans.]

$$\begin{array}{r} 11 \\ 5 \\ \hline 55 \\ 816 \\ 55 \\ \hline 4080 \\ 4080 \\ \hline 2856) 44880 \text{ (15.71 Ans.)} \\ 2856 \end{array}$$

(8)  
 A can do  $\frac{1}{6}$  and B  $\frac{1}{8}$  of it a day.  
 or  $\frac{6}{36}$  and  $\frac{4}{36}$   
 Both can do  $\frac{10}{36}$  of it a day.  
 $10) 36(3\frac{2}{3}$  days, Ans.  
 $\quad 30$   
 $\quad \hline$   
 $2) \frac{6}{10}(\frac{3}{5}$

$$\begin{array}{r} 16320 \\ 14280 \\ \hline 20400 \\ 19992 \\ \hline 4080 \\ 2856 \\ \hline 1224 \end{array}$$

(9)  
 $5|00) 20|00$   
 Ans. 4 yrs.

(10)  
 $\begin{array}{r} 1.50 \\ 3 \\ \hline \$4.50 \text{ a C.} \\ 3\frac{1}{6} \\ \hline 13.50 \\ 75 \\ \hline \end{array}$   
 Ans. \$14.25

## Lesson 166.

(1)

T. cwt. qrs.  
85 6 3

4) 3.0

2|0) 6.75

85.3375

~~85.3375~~ T., what  
6627 [\$1 will buy.

85.3375  
45.333

(2)

4000  
.02  
80.00  
4000 180 polls.  
2  
4080  
360 360

2560125  
2560125  
2560125  
4266875  
3413500

6627) 38686048875 (5 T.  
33135

3720 tax on estates.

5551.048875 or ~~5551.048875~~ T.  
20

\$ ~~3720~~ tax on \$1

3000  
185  
3185 A's estate.  
3720

) 111020977500 (16.7528  
6627 or 16  $\frac{3}{4}$  cwt. a-  
[bout.

6370  
22295  
9555

49889  
46389

35007  
33135

200000) 11848200 (59.24

1000000  
59.24  
1848200 2  
1800000

18727  
13254

\$ 61.24  
[Ans.

54735  
53016

482000  
400000

1719

820000  
800000

(3) 
$$\begin{array}{r} 5 \\ 2 \\ 3 \overline{)10} (3 \text{ h.} \\ \underline{9} \\ 1 \\ 60 \\ \underline{)60} (20 \text{ m.} \\ 6 \\ \underline{0} \end{array}$$

or  $\frac{5}{8}$  of  $\frac{1}{5}$   
or  $\frac{5}{40}$  or  $\frac{1}{8}$

(4) 
$$\begin{array}{r} 8 \overline{)840} \\ 105 \end{array}$$

$$\begin{array}{r} 656.25 ( \quad 6.25 \text{ an acre.} \\ 630 \\ \underline{262} \\ 210 \\ \underline{525} \\ 525 \end{array}$$

$$\begin{array}{r} 6.25 \text{ an acre.} \\ 30 \\ \underline{\$187.50} \text{ Ans.} \end{array}$$

(5)

$\begin{array}{r} 20 \\ 18 \\ \underline{\phantom{00}} \\ 2 \end{array}$	$\begin{array}{r} 22 \\ 20 \\ \underline{\phantom{00}} \\ 2 \end{array}$
2 at 18 and 2 at 22	
$\begin{array}{r} 20 \\ 19 \\ \underline{\phantom{00}} \\ 1 \end{array}$	$\begin{array}{r} 22 \\ 20 \\ \underline{\phantom{00}} \\ 2 \end{array}$
2 at 19 and 1 at 22	

Both mixtures 2 at 18, 2 at 19, and 3 at 22

$$\begin{array}{r} 2 \\ 2 \\ 3 \\ \underline{7} \end{array}$$

Ans.  $\frac{2}{7}$  lb. 18 carats,  $\frac{2}{7}$  lb. 19 carats, and  $\frac{3}{7}$  lb. 22 carats.

(6)

lbs.	oz.	lb.	oz.	pwts.
2	3	1	10	10
12		or 12 oz.		
$\underline{\phantom{00}}$		10.5	210	110
24		$\underline{\phantom{00}}$		
3		60		10.5 oz.
$\underline{\phantom{00}}$		12		
27		$\underline{\phantom{00}}$		
11		126.0		
$\underline{\phantom{00}}$				
27				
27				
$\underline{\phantom{00}}$				
297				

(Carried over.)



(Brought over.)		(7)		
1		1000	4000	2500
27	297	12	8	10
12	126			
		12000	32000	25000
40	40) 423 (10 oz.			
	40	12000		
		32000		
	23	25000		
	20			
	) 460 (11 pwts.		69000	
	40			
		69) 2000 (28.9855		
	60	138		
	40			
		620		
	20	552		
	24			
	) 480 (12 grs.		680	
	40	621		
		590		
	12	552		
		380		
		345		
1.00	(8)			
.025				
			350	
			345	
				5
	1500	28.9855	28.9855	28.9855
	975	12	32	25
	5250			
	4875	579710	579710	1449275
		289855	869565	579710
	3750			
	2925	347.8260	927.5360	724.6375
	8250	\$347.82	\$927.54	\$724.64
	7800	A's share.	B's share.	C's share.
	450			

# MENSURATION.

## Lesson 169.

<p>(1)</p> $\begin{array}{r} 51.75 \\ 32.5 \\ \hline 25875 \\ 10350 \\ 15525 \\ \hline 1681875 \text{ sq. ft.} \\ .55 \\ \hline 8409375 \\ 8409375 \\ \hline 92503125 \end{array}$ <p>Ans. \$925.03</p>	<p>(2)</p> $\begin{array}{r} 60 \\ 60 \\ \hline 40) 3600 \\ \hline 4) 90 \\ \hline 22.5 \\ \text{or } 22\frac{1}{2} \\ \text{[Ans.} \end{array}$	<p>(3)</p> $\begin{array}{r} 18.67 \\ 125 \\ \hline 9335 \\ 3734 \\ \hline 1867 \\ \hline 233375 \\ \text{or } 23\frac{1}{2} \text{ sq. ft.} \\ \text{[about Ans.} \end{array}$																																																																																																																															
<p>(4)</p> $\begin{array}{r} 27\frac{3}{4} \\ \text{or } 27.75 \\ .875 \\ \hline 13875 \\ 19425 \\ \hline 22200 \\ \hline 2428125 \end{array}$ <p>Ans. 2428 about.</p>	<p>(5)</p> $\begin{array}{r} 19.5 \\ 15 \\ \hline 975 \\ 195 \\ \hline 9) 292.5 \\ \hline 32.5 \\ .10 \\ \hline \end{array}$ <p>Ans. \$32.50</p>																																																																																																																																
<p>(6)</p> <table border="0"> <thead> <tr> <th>ft.</th> <th>in.</th> <th>ft.</th> <th>in.</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>9</td> <td>3</td> <td>3</td> </tr> <tr> <td colspan="2">ft.</td> <td colspan="2">ft.</td> </tr> <tr> <td colspan="2">or 5.75</td> <td colspan="2">or 3.25</td> </tr> <tr> <td colspan="2">325</td> <td colspan="2"></td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">2875</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">1150</td> <td colspan="2"></td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">1725</td> <td colspan="2"></td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">186875</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">12 windows.</td> <td colspan="2"></td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">373750</td> <td colspan="2"></td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">186875</td> <td colspan="2"></td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">2242500</td> <td colspan="2"></td> </tr> </tbody> </table>	ft.	in.	ft.	in.	5	9	3	3	ft.		ft.		or 5.75		or 3.25		325				<hr/>				2875				1150				<hr/>				1725				<hr/>				186875				12 windows.				<hr/>				373750				<hr/>				186875				<hr/>				2242500				<table border="0"> <thead> <tr> <th>ft.</th> <th>in.</th> <th>ft.</th> <th>in.</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>3</td> <td>3</td> <td>2</td> </tr> <tr> <td colspan="2">ft.</td> <td colspan="2">ft.</td> </tr> <tr> <td colspan="2">or 5.25</td> <td colspan="2">or 3.1666 &amp;c.</td> </tr> <tr> <td colspan="2">3 <math>\frac{1}{8}</math></td> <td colspan="2">or 3 <math>\frac{1}{8}</math> ft.</td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">15.75</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">.875 — <math>\frac{1}{8}</math></td> <td colspan="2"></td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">16.625</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">7 windows.</td> <td colspan="2"></td> </tr> <tr> <td colspan="2"><hr/></td> <td colspan="2"></td> </tr> <tr> <td colspan="2">116.375</td> <td colspan="2"></td> </tr> </tbody> </table>	ft.	in.	ft.	in.	5	3	3	2	ft.		ft.		or 5.25		or 3.1666 &c.		3 $\frac{1}{8}$		or 3 $\frac{1}{8}$ ft.		<hr/>				15.75				.875 — $\frac{1}{8}$				<hr/>				16.625				7 windows.				<hr/>				116.375			
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116.375																																																																																																																																	

(Carried over.)

(Brought over.)

$$\begin{array}{r}
 224.25 \\
 116.375 \\
 \hline
 340.625 \\
 .20 \\
 \hline
 68.12500 \\
 \text{or } \$68.12\frac{1}{2} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 \text{(7)} \\
 \text{ft. in.} \\
 60 \ 4 \ 57 \\
 \text{or } 60\frac{1}{3} \text{ ft.} \quad 60\frac{1}{3} \\
 \hline
 3420 \\
 19 - \frac{1}{3} \\
 \hline
 1|00) 34|39 \\
 \hline
 34.39 \\
 .40 \\
 \hline
 137560 \\
 \text{Ans. } \$13.76
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 \text{rods. ft.} \\
 16 \ 9 \quad 16.5 \\
 16\frac{1}{2} \quad 5 \text{ rods.} \\
 \hline
 96 \quad 82.5 \\
 16 \quad 8 - \frac{1}{2} \\
 9 \\
 \hline
 273 \\
 82.5 \\
 \hline
 1365 \\
 546 \\
 2184 \\
 \hline
 22522.5 \\
 \text{or } 22,522\frac{1}{2} \text{ sq. ft. Ans.}
 \end{array}$$

$$\begin{array}{r}
 \text{(9)} \\
 40\frac{1}{2} \\
 \text{or } 40.5 \\
 73\frac{2}{3} \\
 \hline
 1215 \\
 2835 \\
 \hline
 2956.5 \\
 13.5 - \frac{1}{3} \\
 13.5 - \frac{1}{3} \\
 \hline
 2) 2983.5 \\
 \hline
 1491.75 \\
 .30 \\
 \hline
 4475250 \\
 \text{Ans. } \$447.52\frac{1}{2}
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 35.6 \\
 91.4 \\
 \hline
 127.0 \\
 10 \\
 \hline
 2) 1270 \\
 \hline
 \text{Ans. } 635 \text{ sq. ft.}
 \end{array}$$

$$\begin{array}{r}
 \text{(11)} \\
 8 \\
 13 \\
 2) 21 \\
 \hline
 10.5 \\
 10.5 \\
 5 \\
 2 \\
 11 \\
 4) 28.5 \\
 \hline
 7.125 \\
 40 \\
 \hline
 285.000 \\
 \text{Ans. } 285 \text{ sq. ft.}
 \end{array}$$

$$\begin{array}{r}
 \text{(12)} \\
 3.14159 \\
 50 \\
 \hline
 157.07950 \\
 25 \\
 \hline
 7853975 \\
 3141590 \\
 \hline
 2) 3926.9875 \\
 \hline
 196349375 \\
 \text{Ans. } 1963.49 \text{ sq. ft. about.}
 \end{array}$$

**Lesson 170.**

<p style="text-align: center;"><b>(1)</b></p> $  \begin{array}{r}  3.14159 \\  \underline{12} \\  628318 \\  314159 \\  \hline  37.69908 \\  6 \\  \hline  2) 226.19448 \\  \hline  2) 113.09724 \text{ whole circle.} \\  \hline  56.54862 \\  \text{Ans. } 56.549 \text{ sq. ft. nearly.}  \end{array}  $	<p style="text-align: center;"><b>(2)</b></p> $  \begin{array}{r}  3.14159 \\  \underline{5.5} \\  1570795 \\  1570795 \\  \hline  17.278745 \\  2.75 \\  \hline  2) 5.5 \\  \hline  2.75 \\  \hline  86393725 \\  120951215 \\  \hline  34557490 \\  \hline  2) 47.51654875 \\  \hline  4) 23.758274375 \text{ whole circle.} \\  \hline  5.93956 \text{ \&c.} \\  \text{Ans. } 5.94 \text{ sq. rods, nearly.}  \end{array}  $						
<p style="text-align: center;"><b>(3)</b></p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: right;">ft.</td> <td style="text-align: right;">in.</td> </tr> <tr> <td style="text-align: right;">18</td> <td style="text-align: right;">9</td> </tr> <tr> <td colspan="2" style="text-align: center;">or ft.</td> </tr> </table> $  \begin{array}{r}  3.14159) 18.75000 \text{ (5.968 ft. about} \\  \underline{1570795} \\  3042050 \\  \underline{2827431} \\  2146190 \\  \underline{1884954} \\  2612360 \\  \underline{2513272} \\  99088  \end{array}  $	ft.	in.	18	9	or ft.		<p style="text-align: center;"><b>(4)</b></p> $  \begin{array}{r}  1 \\  4 \\  \hline  4 \\  40 \\  \hline  16) 160 \text{ (10 rods, Ans.} \\  \underline{16} \\  0  \end{array}  $
ft.	in.						
18	9						
or ft.							
<p style="text-align: center;"><b>(5)</b></p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: right;">ft.</td> <td style="text-align: right;">in.</td> </tr> <tr> <td style="text-align: right;">12</td> <td style="text-align: right;">6</td> </tr> <tr> <td colspan="2" style="text-align: center;">ft.</td> </tr> </table> $  \begin{array}{r}  \text{or } 12.5) 225.0 \text{ (18 ft. Ans.} \\  \underline{125} \\  1000 \\  \underline{1000}  \end{array}  $	ft.	in.	12	6	ft.		<p style="text-align: center;"><b>(6)</b></p> $  \begin{array}{r}  1 \\  4 \\  \hline  4 \\  40 \\  \hline  160 \text{ sq. rods in 1 A.} \\  2 \text{ A.} \\  \hline  320 \\  2 \\  \hline  2) 640 \\  \hline  \text{Ans. } 32 \text{ rods.}  \end{array}  $
ft.	in.						
12	6						
ft.							

(7)

18	ft. in.	ft. in.	
16	3 10	5 4	
<hr style="width: 50%; margin: 0;"/>	ft.	ft.	
34	or $3.83\frac{1}{3}$	or $5\frac{1}{3}$	3.5
2	7		$5\frac{1}{3}$
<hr style="width: 50%; margin: 0;"/>			
68	26.81	17.5	
10	2333 &c. — $\frac{1}{3}$	1.16666 &c. — $\frac{1}{3}$	
<hr style="width: 50%; margin: 0;"/>			
680	26.83333 &c.	18.66666 &c.	5
	2	2	5
	<hr style="width: 50%; margin: 0;"/>	<hr style="width: 50%; margin: 0;"/>	
	53.66666 &c.	37.33333 &c.	<hr style="width: 50%; margin: 0;"/> 25
	3.83 $\frac{1}{3}$		
	2		
	<hr style="width: 50%; margin: 0;"/>		
	7.66 $\frac{2}{3}$		
	or $7\frac{2}{3}$		
	5		
	<hr style="width: 50%; margin: 0;"/>		
	68 ft. circumference of the room.		
	12 $\frac{2}{3}$	12 $\frac{2}{3}$	
	<hr style="width: 50%; margin: 0;"/>		
	55 $\frac{1}{3}$	10 in. wide.	
	or $18\frac{6}{13}$ ft.	or $1\frac{1}{2}$ or $\frac{5}{8}$ ft. wide.	
	3	166	
	6	5	
	<hr style="width: 50%; margin: 0;"/>	<hr style="width: 50%; margin: 0;"/>	
	18	18) 830 (46.11111 &c.	
		72	
		<hr style="width: 50%; margin: 0;"/>	
		110	
		108	
		<hr style="width: 50%; margin: 0;"/>	
		20	
		18	
		<hr style="width: 50%; margin: 0;"/>	
		20	
		53.66666 &c.	
		37.33333 &c.	
		25	
		46.11111 &c.	
		<hr style="width: 50%; margin: 0;"/>	
		162.11111 &c.	
680			
162.11111			
<hr style="width: 50%; margin: 0;"/>			
9) 517.88888			
<hr style="width: 50%; margin: 0;"/>			
57.5432			
Ans. 57.543			

(8)

26	32	41
8	25	13
<hr/>	<hr/>	<hr/>
208	160	123
	64	41
<hr/>	<hr/>	<hr/>
208		
800	800	533
533		
<hr/>		
2)1541	4	
	<hr/>	
40)770.5	(19(4 A.	
40	16	
<hr/>	<hr/>	
370	3 qrs.	
360		
<hr/>		

10.5 sq. rods.

(9)

ft.	in.
18	9
<hr/>	<hr/>
ft.	
or 18.75	
20	
<hr/>	<hr/>
375.00	
20.83333 &c.	
<hr/>	<hr/>
9)35416666 &c.	
<hr/>	<hr/>
3935185 &c.	

Ans. 39.352 nearly.

ft.	in.
4	2
<hr/>	<hr/>
ft.	
or 4.1666	
5	
<hr/>	<hr/>
20.80	
1666 &c. $\frac{1}{3}$	
1666 &c. $\frac{1}{3}$	
<hr/>	<hr/>
20.83333 &c.	

(10)

yds.	yds.
26 $\frac{3}{4}$ times 1 $\frac{1}{2}$	
or 19 $\frac{1}{4}$ times $\frac{3}{8}$	
4	107
8	9
<hr/>	<hr/>
32	963
<hr/>	<hr/>
$\frac{3}{4}$ in	$\frac{363}{32}$
4)32	3)963
<hr/>	<hr/>
8	321
<hr/>	<hr/>
$\frac{321}{8}$	8)321
<hr/>	<hr/>

Ans. 40 $\frac{1}{8}$  yds.

(11)

6
6
<hr/>
36 sq. miles.
640
<hr/>
144
216
<hr/>
23,040 acres.

(12)

7
19
<hr/>
2)26
<hr/>
13
11
5
6
16
<hr/>
5)51
<hr/>
10.2
100
<hr/>
1020.0

Ans. 1,020 sq. ft.

## Lesson 173.

(1)

ft.	in.
6	6

or 6.5 ft.  
6.5

---

325  
390

---

4225  
65

---

21125  
25350

---

274625

Ans. 274 $\frac{5}{8}$ 

(2)

4
4

---

16  
4

---

64 cubic ft.

16) 64 ( 4 ft. of wood.  
64

(3)

ft.	in.
4	5

ft.	in.
5	4

ft.  
say 4.4  
8

ft.  
say 5.3

1
8
<hr/>
8
16
<hr/>
48
8
<hr/>

1056
1760

128    128) 18656 ( 14575 C.  
128

---

585  
512

---

14575  
6

---

736  
640

---

87450  
\$8.74 $\frac{1}{2}$

---

960  
896

---

640  
640

(4)

C.	ft.
5	5

8  

---

40  
5

---

45  
16

20	270
4	45

---

80    80) 720

Ans. 9 ft.

<p>(5)</p> <table border="0" style="margin: auto;"> <tr> <td style="text-align: center;">ft. in.</td> <td style="text-align: center;">ft. in.</td> <td style="text-align: center;">ft. in.</td> </tr> <tr> <td style="text-align: center;">7 2</td> <td style="text-align: center;">4 6</td> <td style="text-align: center;">4 7</td> </tr> </table>		ft. in.	ft. in.	ft. in.	7 2	4 6	4 7	<p>(6)</p> <table border="0" style="margin: auto;"> <tr> <td style="text-align: center;">30.4</td> </tr> <tr> <td style="text-align: center;">4</td> </tr> </table>		30.4	4
ft. in.	ft. in.	ft. in.									
7 2	4 6	4 7									
30.4											
4											
<p>ft.</p> <p>say 7.2</p> <p>4.5</p> <hr style="width: 50px; margin: 0 auto;"/> <p>360</p> <p>288</p> <hr style="width: 50px; margin: 0 auto;"/> <p>32.40</p> <p>4.6</p> <hr style="width: 50px; margin: 0 auto;"/> <p>1944</p> <p>1296</p> <hr style="width: 50px; margin: 0 auto;"/> <p>16)149.04</p> <p>144</p> <hr style="width: 50px; margin: 0 auto;"/> <p>50</p> <p>48</p> <hr style="width: 50px; margin: 0 auto;"/> <p>24</p> <p>16</p> <hr style="width: 50px; margin: 0 auto;"/> <p>80</p> <p>80</p>		<p>ft.</p> <p>say 4.5</p> <p>4.3</p> <hr style="width: 50px; margin: 0 auto;"/> <p>3648</p> <p>4864</p> <hr style="width: 50px; margin: 0 auto;"/> <p>8</p> <p>16)522.88</p> <p>48</p> <hr style="width: 50px; margin: 0 auto;"/> <p>42</p> <p>32</p> <hr style="width: 50px; margin: 0 auto;"/> <p>108</p> <p>96</p> <hr style="width: 50px; margin: 0 auto;"/> <p>128</p> <p>128</p>									
<p>8</p> <p>(9.315 (1 C.</p> <p>8</p> <hr style="width: 50px; margin: 0 auto;"/> <p>1.315 ft.</p>		<p>32.68 (4085 C.</p> <p>32</p> <hr style="width: 50px; margin: 0 auto;"/> <p>68</p> <p>64</p> <hr style="width: 50px; margin: 0 auto;"/> <p>40</p> <p>40</p>									
		<p>[Ans.</p>									

<p>(7)</p> <table border="0" style="margin: auto;"> <tr> <td style="text-align: center;">ft. in.</td> <td style="text-align: center;">ft. in.</td> </tr> <tr> <td style="text-align: center;">35 8</td> <td style="text-align: center;">1 3</td> </tr> </table>		ft. in.	ft. in.	35 8	1 3	<p>(8)</p> <table border="0" style="margin: auto;"> <tr> <td style="text-align: center;">ft. in.</td> </tr> <tr> <td style="text-align: center;">1 4</td> </tr> </table>		ft. in.	1 4
ft. in.	ft. in.								
35 8	1 3								
ft. in.									
1 4									
<p>ft.</p> <p>or 35<math>\frac{1}{2}</math></p>		<p>ft.</p> <p>or 1<math>\frac{1}{2}</math></p>							
<p>or 1.25</p> <p>2</p> <hr style="width: 50px; margin: 0 auto;"/> <p>2.50</p> <p>35<math>\frac{1}{2}</math></p> <hr style="width: 50px; margin: 0 auto;"/> <p>125</p> <p>75</p> <hr style="width: 50px; margin: 0 auto;"/> <p>87.5</p> <p>.8333 &amp;c. <math>\frac{1}{3}</math></p> <p>.8333 &amp;c. <math>\frac{1}{3}</math></p> <hr style="width: 50px; margin: 0 auto;"/> <p>5)0)89.1666 &amp;c.</p> <hr style="width: 50px; margin: 0 auto;"/> <p>1.78333 &amp;c.</p> <p>9</p> <hr style="width: 50px; margin: 0 auto;"/> <p>16.04999 &amp;c.</p>		<p>3</p> <hr style="width: 50px; margin: 0 auto;"/> <p>3</p> <p>1 - <math>\frac{1}{3}</math></p> <hr style="width: 50px; margin: 0 auto;"/> <p>2)4</p> <hr style="width: 50px; margin: 0 auto;"/> <p>2</p> <p>28</p> <hr style="width: 50px; margin: 0 auto;"/> <p>16</p> <p>4</p> <hr style="width: 50px; margin: 0 auto;"/>							
<p>Ans. \$16.05</p>		<p>Ans. 56</p>							



		(9)		(10)
		35	22	
		20	30	
	1600	—	—	
40	15	15	660	
40	—		8	
	80			
1600	16		cubic yds.	
20	—	27)5280(195.555 &c.	195.555 &c.	
	2)24000	27	.06	
32000	—	258	11.73333 &c.	
12000	12000	243		
			Ans. \$ 11.73	
44,000	cubic ft. Ans.	150		

		(11)		(12)
		3.14159		3.14159
	4 ft. in diam.			4 ft. in diam.
		12.56636		12.56636
		2		2
		2)25.13272		2)25.13272
		12.56636		12.56636
	5 5 in. or $\frac{5}{12}$ ft.			42
		12)62.83180(5.23598		2513272
		60		5026544
	Ans. 5.236 cubic ft.			50)527.78712
		28		10.5557424
		24		Ans. 10.556 T. nearly.
		—		
		43		
		36		
		—		
		71		
		60		
		—		
		118		
		108		
		—		
		100		
		96		
		—		
		4		

Lesson 174.

<p>(1)</p> <table border="0"> <tr> <td>ft.</td> <td>in.</td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>12</td> <td></td> </tr> <tr> <td>—</td> <td></td> </tr> <tr> <td>12</td> <td></td> </tr> <tr> <td>2</td> <td></td> </tr> <tr> <td>—</td> <td></td> </tr> <tr> <td>14</td> <td></td> </tr> <tr> <td>2½</td> <td></td> </tr> <tr> <td>—</td> <td></td> </tr> <tr> <td>28</td> <td></td> </tr> <tr> <td>7 — ½</td> <td></td> </tr> <tr> <td>—</td> <td></td> </tr> <tr> <td>2)35</td> <td></td> </tr> <tr> <td>—</td> <td></td> </tr> <tr> <td>17.5</td> <td></td> </tr> <tr> <td>3</td> <td></td> </tr> <tr> <td>—</td> <td></td> </tr> </table>	ft.	in.	1	2	12		—		12		2		—		14		2½		—		28		7 — ½		—		2)35		—		17.5		3		—		<p>(2)</p> <table border="0"> <tr> <td>1.25</td> </tr> <tr> <td>1.5</td> </tr> <tr> <td>—</td> </tr> <tr> <td>625</td> </tr> <tr> <td>125</td> </tr> <tr> <td>—</td> </tr> <tr> <td>1.875</td> </tr> <tr> <td>20</td> </tr> <tr> <td>—</td> </tr> <tr> <td>5)03)7.500</td> </tr> <tr> <td>—</td> </tr> <tr> <td>.75</td> </tr> <tr> <td>8</td> </tr> <tr> <td>—</td> </tr> <tr> <td>Ans. \$6.00</td> </tr> </table>	1.25	1.5	—	625	125	—	1.875	20	—	5)03)7.500	—	.75	8	—	Ans. \$6.00	<p>(3)</p> <table border="0"> <tr> <td>3.14159</td> <td>ft.</td> <td>in.</td> </tr> <tr> <td>2.25</td> <td>2</td> <td>3</td> </tr> <tr> <td>—</td> <td></td> <td></td> </tr> <tr> <td>1570795</td> <td>ft.</td> <td></td> </tr> <tr> <td>628318</td> <td>or 2.25</td> <td></td> </tr> <tr> <td>628318</td> <td>2)225</td> <td></td> </tr> <tr> <td>—</td> <td></td> <td></td> </tr> <tr> <td>7.0685775</td> <td>1.125</td> <td></td> </tr> <tr> <td></td> <td>1½</td> <td>or 1½</td> </tr> <tr> <td>—</td> <td></td> <td></td> </tr> <tr> <td>7.0685775</td> <td></td> <td></td> </tr> <tr> <td>.8835721875</td> <td></td> <td></td> </tr> <tr> <td>2)7.9521496875</td> <td></td> <td></td> </tr> <tr> <td>—</td> <td></td> <td></td> </tr> <tr> <td>3.97607484375</td> <td></td> <td></td> </tr> <tr> <td>41</td> <td></td> <td></td> </tr> <tr> <td>—</td> <td></td> <td></td> </tr> <tr> <td>39.760748</td> <td></td> <td></td> </tr> <tr> <td>159042992</td> <td></td> <td></td> </tr> <tr> <td>—</td> <td></td> <td></td> </tr> <tr> <td>163.0190668</td> <td></td> <td></td> </tr> <tr> <td>Ans. 163.019 cubic ft.</td> <td></td> <td></td> </tr> </table>	3.14159	ft.	in.	2.25	2	3	—			1570795	ft.		628318	or 2.25		628318	2)225		—			7.0685775	1.125			1½	or 1½	—			7.0685775			.8835721875			2)7.9521496875			—			3.97607484375			41			—			39.760748			159042992			—			163.0190668			Ans. 163.019 cubic ft.		
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Ans. 163.019 cubic ft.																																																																																																																							

Ans. 52.5 cubic in.

[about.]

<p>(4)</p> <table border="0"> <tr> <td>700</td> </tr> <tr> <td>700</td> </tr> <tr> <td>—</td> </tr> <tr> <td>490000</td> </tr> <tr> <td>500</td> </tr> <tr> <td>—</td> </tr> <tr> <td>3)245000000</td> </tr> <tr> <td>—</td> </tr> <tr> <td>27)81666666.666</td> </tr> <tr> <td>81</td> </tr> <tr> <td>—</td> </tr> <tr> <td>66</td> </tr> <tr> <td>54</td> </tr> <tr> <td>—</td> </tr> <tr> <td>126</td> </tr> <tr> <td>108</td> </tr> <tr> <td>—</td> </tr> <tr> <td>186</td> </tr> <tr> <td>162</td> </tr> <tr> <td>—</td> </tr> <tr> <td>246</td> </tr> <tr> <td>243</td> </tr> <tr> <td>—</td> </tr> <tr> <td>36</td> </tr> <tr> <td>27</td> </tr> <tr> <td>—</td> </tr> <tr> <td>96</td> </tr> <tr> <td>81</td> </tr> <tr> <td>—</td> </tr> <tr> <td>156</td> </tr> <tr> <td>135</td> </tr> <tr> <td>—</td> </tr> <tr> <td>216</td> </tr> <tr> <td>216</td> </tr> <tr> <td>—</td> </tr> <tr> <td>6</td> </tr> </table>	700	700	—	490000	500	—	3)245000000	—	27)81666666.666	81	—	66	54	—	126	108	—	186	162	—	246	243	—	36	27	—	96	81	—	156	135	—	216	216	—	6	<p>&amp;c. (3,024,691.358 cubic yds.</p> <table border="0"> <tr> <td>2</td> </tr> <tr> <td>—</td> </tr> <tr> <td>\$6,049,382.716</td> </tr> </table>	2	—	\$6,049,382.716
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<p>(5)</p> <table border="0"> <tr> <td>21.25</td> </tr> <tr> <td>18.33</td> </tr> <tr> <td>—</td> </tr> <tr> <td>6375</td> </tr> <tr> <td>6375</td> </tr> <tr> <td>—</td> </tr> <tr> <td>17000</td> </tr> <tr> <td>2125</td> </tr> <tr> <td>—</td> </tr> <tr> <td>3)389.5125</td> </tr> <tr> <td>—</td> </tr> <tr> <td>Ans. 129.8375 cubic ft.</td> </tr> </table>	21.25	18.33	—	6375	6375	—	17000	2125	—	3)389.5125	—	Ans. 129.8375 cubic ft.
21.25												
18.33												
—												
6375												
6375												
—												
17000												
2125												
—												
3)389.5125												
—												
Ans. 129.8375 cubic ft.												

$$\begin{array}{r}
 \text{(6)} \\
 3.14159 \\
 \quad 12 \\
 \hline
 628318 \\
 314159 \\
 \hline
 37.69908 \\
 \quad 6 \\
 2) 226.19448 \\
 \hline
 113.09724 \text{ sq. ft. surface} \\
 \quad 4.45 \text{ of base.} \\
 \hline
 56548620 \\
 45238896 \\
 \hline
 45238896 \\
 3) 5032827180 \\
 \hline
 1677.60906
 \end{array}$$

Ans. 1,677.609 cubic ft. about.

$$\begin{array}{r}
 \text{ft.} \\
 2.25 \\
 \text{or } 2\frac{1}{4} \text{ ft.} \\
 \text{(7)} \\
 3.14159 \\
 \quad 2\frac{1}{4} \\
 \hline
 6.28318 \\
 .7853975 \\
 \hline
 7.0685775 \text{ circum.} \\
 \quad 2\frac{1}{4} \\
 \hline
 14.1371550 \\
 1.767144375 \\
 2) 2\frac{1}{4} 15.904299375 \text{ sq. ft. surface.} \\
 \hline
 1\frac{1}{8} 15.904299375 \\
 \hline
 1.988037421875 \\
 3) 17.892336796875 \\
 \hline
 5.964112 \&c.
 \end{array}$$

Ans. 5.964 cubic ft. about.

$$\begin{array}{r}
 \text{(9)} \\
 1.5 \\
 .8 \\
 3.5) .70 \text{ (.2 ft. contraction in rising 1 ft.} \\
 \quad 70 \\
 \hline
 .2) 1.50 \\
 \quad 7.5 \text{ ft. to come to a point.} \\
 \quad 3.5 \\
 \hline
 4.0 \text{ ft. height of little cone.}
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 18.5 \\
 \quad 11 \\
 \hline
 18.5 \\
 18.5 \\
 \hline
 203.5 \\
 9.33 \\
 \hline
 610.5 \\
 610.5 \\
 \hline
 1831.5 \\
 \hline
 \text{Ans. 1,898.655 cubic ft.}
 \end{array}$$

$$\begin{array}{r}
 3.14159 \\
 \quad 1.5 \\
 \hline
 1570795 \\
 314159 \\
 2) 1.5 4.712385 \\
 \hline
 .75 \quad .75 \\
 \hline
 23561925 \\
 32986695 \\
 2) 3.53428875 \\
 \hline
 1.767144375 \text{ sq. ft. surface} \\
 \quad 7.5 \text{ [at bottom.} \\
 \hline
 8835721875 \\
 12370010625 \\
 3) 13.2535828125 \\
 \hline
 4.4178609375 \\
 .6702058666 \\
 \hline
 3.7476550709
 \end{array}$$

Ans. 3.748 sq. ft. nearly.

$$\begin{array}{r}
 3.14159 \\
 \quad .8 \\
 \hline
 2.513272 \\
 \quad .4 \\
 2) 1.0053088 \\
 \hline
 .5026544 \text{ sq. ft. sur-} \\
 \quad 4 \text{ [face at top.} \\
 3) 2.0106176 \\
 \hline
 .670205866 \&c.
 \end{array}$$

(10)

$$\begin{array}{r}
 16 \\
 10 \\
 36 \overline{) 6.0} (.1666 \text{ \&c.} \\
 \underline{36} \quad \text{or } \frac{1}{6} \text{ in. contraction in rising 1 in.} \\
 240 \\
 \underline{216} \\
 240
 \end{array}$$

Dividing 16 by  $\frac{1}{6}$   
6

$\frac{96}{36}$  in. to come to a point.

36

$\frac{60}{60}$  in. height of little cone.

$$\begin{array}{r}
 3.14159 \\
 16 \\
 \hline
 1884954 \\
 314159 \\
 \hline
 50.26544 \\
 8
 \end{array}$$

$$\begin{array}{r}
 2 \overline{) 402.12352} \\
 \underline{20106176} \text{ sq. ft. surface} \\
 96 \text{ [at bottom.}
 \end{array}$$

$$\begin{array}{r}
 120637056 \\
 180955584 \\
 3 \overline{) 1930192896} \\
 \underline{643397632} \\
 1570.795
 \end{array}$$

$$\begin{array}{r}
 231 \overline{) 4863.18132} (21.0527 \\
 \underline{462} \quad \text{Ans. 21.053 gals. nearly.}
 \end{array}$$

$$\begin{array}{r}
 243 \\
 231 \\
 \hline
 1218 \\
 1155 \\
 \hline
 631 \\
 462 \\
 \hline
 1693 \\
 1617 \\
 \hline
 76
 \end{array}$$

$$\begin{array}{r}
 3.14159 \\
 10 \\
 \hline
 3141590 \\
 5
 \end{array}$$

$$\begin{array}{r}
 2 \overline{) 157.0795} \\
 \underline{7853975} \text{ sq. ft. surface} \\
 60 \text{ [at top.}
 \end{array}$$

$$\begin{array}{r}
 3 \overline{) 471238500} \\
 \underline{1570.795}
 \end{array}$$

## Lesson 175.

(1)

4

3

3)  $\overline{1.0}$  $\overline{.333}$  &c.or  $\frac{1}{3}$  ft. contraction in rising 1 ft.Dividing 4 by  $\frac{1}{3}$ 

3

 $\overline{12}$  ft. to come to a point.

4

 $\overline{9}$  ft. height of little cone.

3.14159

4

 $\overline{1256636}$ 

2

2)  $\overline{2513272}$  $\overline{1256636}$  sq. ft. surface

12

[at top.]

 $\overline{2513272}$  $\overline{1256636}$ 3)  $\overline{15079632}$  $\overline{5026544}$  $\overline{212057325}$  $\overline{290597075}$  cubic ft.

1728

 $\overline{2324776600}$  $\overline{581194150}$  $\overline{2034179525}$  $\overline{290597075}$ 231)  $\overline{502151745600}$  (217.38 wine gals. about Ans.

462

401

231

 $\overline{1705}$  $\overline{1617}$ 

881

693

 $\overline{1887}$  $\overline{1848}$  $\overline{39}$ 

3.14159

3

 $\overline{942477}$  $\overline{1\frac{1}{2}}$  $\overline{942477}$  $\overline{4712385}$ 2)  $\overline{14137155}$  $\overline{70685775}$  sq. ft. surface

9 [at bottom.]

3)  $\overline{636171975}$  $\overline{212057325}$

(2)

$$\begin{array}{r}
 8 \\
 2 \\
 \hline
 18 \overline{)6.0} (.333 \text{ \&c.} \\
 \underline{54} \quad \text{or } \frac{1}{3} \text{ ft. contraction} \\
 \quad \quad \quad \text{[in rising 1 ft.} \\
 60 \\
 \underline{54} \\
 6 \\
 \text{Dividing 8 by } \frac{1}{3} \\
 3 \\
 \hline
 24 \text{ ft. to come to a} \\
 18 \quad \quad \text{[point.} \\
 \hline
 \end{array}$$

6 ft., height of little pyramid.

(3)

$$\begin{array}{r}
 2 \\
 2 \\
 \hline
 4 \\
 \text{6 sides.} \\
 \hline
 \text{Ans. 24 sq. ft.}
 \end{array}$$

(4)

1.5	ft.	in.	ft.	ft.
4	2	2	1.5	2
6.0	ft.	ft.	ft.	ft.
2	or $\frac{1}{2}$	or $\frac{1}{2}$	or $\frac{3}{8}$	or $\frac{1}{2}$
	$\frac{1}{6}$ ft. wide.		$\frac{3}{8}$ times $\frac{1}{6}$	
$1\frac{1}{2}$ sq. ft. surface of top and bottom.	11		6	11
$14\frac{8}{9}$	4 ft. length.		6	8
$4\frac{8}{9}$	44		36	88
Ans. $31\frac{1}{3}$	$\frac{44}{6}$ sq. ft. surface [of 1 side.		$\frac{88}{36}$ sq. ft. surface [of 1 end.	
	2)6		2)36	
	3		18	
	$\frac{44}{3}$ sq. ft. surface [of 2 sides.		$\frac{88}{18}$ or $\frac{44}{9}$ sq. ft. surface [of 2 ends.	
	3)44		9)44	
	$14\frac{2}{3}$		$4\frac{8}{9}$	
	or $14\frac{8}{9}$			

## MENSURATION.

$$\begin{array}{r}
 (5) \\
 2\frac{1}{2} \\
 1\frac{1}{2} \\
 1 \\
 \hline
 5 \\
 12 \\
 \hline
 \text{Ans. } 60 \text{ sq. ft.}
 \end{array}$$

$$\begin{array}{r}
 (6) \\
 3.14159 \\
 \quad 3 \\
 \hline
 9.42477 \\
 \quad 20 \\
 \hline
 188.49540 \\
 \text{Ans. } 188.495 \text{ sq. ft.} \\
 \text{[about.]}
 \end{array}$$

$$\begin{array}{r}
 (7) \\
 13 \\
 23 \\
 \hline
 39 \\
 26 \\
 \hline
 2)299 \\
 \hline
 149.5 \\
 \quad 4 \text{ sides.} \\
 \hline
 \text{Ans. } 598.0 \text{ sq. ft.}
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 3.14159 \\
 \quad 6 \\
 \hline
 18.84954 \\
 \quad 18 \\
 \hline
 15079632 \\
 1884954 \\
 \hline
 2)339.29172 \\
 \hline
 169.64586 \\
 169.646 \text{ sq. ft.} \\
 \text{[nearly, Ans.]}
 \end{array}$$

$$\begin{array}{r}
 (9) \\
 4 \\
 2 \\
 \hline
 7)2 \\
 \quad \frac{2}{7} \text{ ft. contraction} \\
 \quad \text{in rising 1 ft.} \\
 \text{Dividing 4 by } \frac{2}{7} \\
 \quad 7 \\
 \hline
 2)28 \\
 \quad 14 \text{ ft. to come} \\
 \quad \text{to a point.} \\
 \quad 7 \\
 \hline
 7 \text{ ft. slant} \\
 \text{height of} \\
 \text{little cone.} \\
 \hline
 3.14159 \\
 \quad 4 \\
 \hline
 12.56636 \\
 \quad 14 \\
 \hline
 5026544 \\
 1256636 \\
 \hline
 2)175.92904 \\
 \hline
 87.96452 \\
 21.99113 \\
 \hline
 65.97339 \\
 65.973 \text{ sq. ft. about, Ans.}
 \end{array}$$

$$\begin{array}{r}
 (10) \\
 3.14159 \\
 \quad 7920 \\
 \hline
 628318 \\
 2827431 \\
 2199113 \\
 \hline
 2488139280 \\
 \quad 7920 \\
 \hline
 497627856 \\
 2239325352 \\
 1741697496 \\
 \hline
 2)19706063097600 \\
 \hline
 \text{Ans. } 98,530,315.488 \text{ sq. miles.}
 \end{array}$$

**Lesson 176.**

<p style="text-align: center;">(1)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">ft. in.</td> <td style="text-align: center;">ft. in.</td> </tr> <tr> <td style="text-align: center;">1 3</td> <td style="text-align: center;">19 4</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">ft.</td> <td style="text-align: center;">ft.</td> </tr> <tr> <td style="text-align: center;">or 1.25</td> <td style="text-align: center;">or 19 <math>\frac{1}{2}</math></td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">1 1 2 5</td> <td></td> </tr> <tr> <td style="text-align: center;">1 2 5</td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">2 3.7 5</td> <td></td> </tr> <tr> <td style="text-align: center;">.4 1 6 6 &amp;c. — <math>\frac{1}{2}</math></td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">2 4.1 6 6 &amp;c.</td> <td></td> </tr> <tr> <td style="text-align: center;">4 0</td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">9 6 6 6 6 6 &amp;c.</td> <td></td> </tr> </table> <p>Ans. 9 6 6 <math>\frac{3}{4}</math> ft.</p>	ft. in.	ft. in.	1 3	19 4	ft.	ft.	or 1.25	or 19 $\frac{1}{2}$	1 1 2 5		1 2 5		2 3.7 5		.4 1 6 6 &c. — $\frac{1}{2}$		2 4.1 6 6 &c.		4 0		9 6 6 6 6 6 &c.		<p style="text-align: center;">(2)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">ft. in.</td> <td style="text-align: center;">ft. in.</td> </tr> <tr> <td style="text-align: center;">2 3</td> <td style="text-align: center;">2 3</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">ft.</td> <td style="text-align: center;">ft.</td> </tr> <tr> <td style="text-align: center;">or 2.2 5</td> <td style="text-align: center;">3 3</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">6 7 5</td> <td></td> </tr> <tr> <td style="text-align: center;">6 7 5</td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">7 4.2 5</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">2 2 2.7 5</td> <td></td> </tr> <tr> <td style="text-align: center;">2 planks.</td> <td></td> </tr> </table> <p>Ans. 4 4 5.5 0 ft.</p>	ft. in.	ft. in.	2 3	2 3	ft.	ft.	or 2.2 5	3 3	6 7 5		6 7 5		7 4.2 5		3		2 2 2.7 5		2 planks.		<p style="text-align: center;">(3)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">in.</td> <td style="text-align: center;">4) 18</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">—</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">ft.</td> <td style="text-align: center;">4.5</td> </tr> <tr> <td style="text-align: center;">or <math>\frac{1}{4}</math></td> <td style="text-align: center;">5</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">2 2.5</td> <td></td> </tr> <tr> <td style="text-align: center;">2 0</td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">1 0 0 0) 4 5 0.0</td> <td></td> </tr> <tr> <td style="text-align: center;">.4 5</td> <td></td> </tr> <tr> <td style="text-align: center;">2 0</td> <td></td> </tr> </table> <p>Ans. \$ 9.0 0</p>	in.	4) 18	3	—	ft.	4.5	or $\frac{1}{4}$	5	2 2.5		2 0		1 0 0 0) 4 5 0.0		.4 5		2 0	
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	<p style="text-align: center;">(7)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">8 7</td> <td></td> </tr> <tr> <td style="text-align: center;">7</td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">6 0 9</td> <td></td> </tr> <tr> <td style="text-align: center;">1 2.5</td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">3 0 4 5</td> <td></td> </tr> <tr> <td style="text-align: center;">1 2 1 8</td> <td></td> </tr> <tr> <td style="text-align: center;">6 0 9</td> <td></td> </tr> <tr> <td style="border-top: 1px solid black; text-align: center;">2 4 <math>\frac{3}{4}</math></td> <td></td> </tr> </table> <p>or 2 4.7 5) 7 6 1 2.5 0 (3 0 7.5 7 5 7</p> <p style="text-align: center;">(Carried over.)</p>	8 7		7		6 0 9		1 2.5		3 0 4 5		1 2 1 8		6 0 9		2 4 $\frac{3}{4}$																																														
8 7																																																														
7																																																														
6 0 9																																																														
1 2.5																																																														
3 0 4 5																																																														
1 2 1 8																																																														
6 0 9																																																														
2 4 $\frac{3}{4}$																																																														



## MENSURATION.

(Brought over.)

$$\begin{array}{r} 24\frac{1}{2} \\ \text{or } 24.75 \end{array} 7612.50 \quad (307.5757 \quad 307.5757 \quad 1.80$$

$$\begin{array}{r} 18750 \\ 17325 \\ \hline \end{array}$$

$$\begin{array}{r} 24606056 \\ 3075757 \\ \hline \end{array}$$

$$\begin{array}{r} 14250 \\ 12375 \\ \hline \end{array}$$

$$\begin{array}{r} 55363626 \\ \hline \end{array}$$

Ans. \$553.64

$$\begin{array}{r} 18750 \\ \hline \end{array}$$

(8)

$$\begin{array}{r} 48 \text{ one side} \quad 26 \\ 48 \text{ one side} \quad 2 \text{ ft. out for side walls.} \\ 24 \text{ one end} \quad 24 \\ 24 \text{ one end} \quad 26 \end{array}$$

$$\begin{array}{r} 144 \\ 19 \\ \hline \end{array}$$

$$\begin{array}{r} 26 \\ 15 \\ \hline 130 \end{array}$$

$$\begin{array}{r} 1296 \quad \text{in.} \\ 144 \quad 8 \\ \hline \end{array}$$

$$\begin{array}{r} 26 \\ 300 \text{ sq. ft. surface in both gable ends.} \\ 2 \end{array}$$

$$\begin{array}{r} 2736 \\ 260 \\ \hline \end{array}$$

$$\begin{array}{r} 26 \\ 300 \text{ sq. ft. surface in both gable ends.} \\ 2 \end{array}$$

$$\begin{array}{r} 8 \\ 4 \\ \hline 32 \\ 2 \\ \hline \end{array}$$

$$\begin{array}{r} 2996 \\ 514 \text{ outs for doors and windows.} \\ \hline \end{array}$$

$$\begin{array}{r} 2482 \\ \hline \end{array}$$

$$\begin{array}{r} 64)1728(27 \quad 27 \text{ bricks in a cubic ft.} \\ 128 \\ \hline \end{array}$$

$$\begin{array}{r} 17374 \\ \hline \end{array}$$

$$\begin{array}{r} 448 \\ 448 \\ \hline \end{array}$$

Ans. 67,014 bricks.

(9)

$$\begin{array}{r} 3.14159 \\ 10 \\ \hline \end{array}$$

$$\begin{array}{r} 31.41590 \\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} 2)157.0795 \\ \hline \end{array}$$

$$\begin{array}{r} 78.53975 \\ \hline \end{array}$$

Ans. 78.54 sq. in. nearly.

(10)

$$\begin{array}{r} 12 \\ 20 \\ \hline \end{array}$$

$$\begin{array}{r} 240 \\ 2\frac{1}{2} \\ \hline \end{array}$$

$$\begin{array}{r} 480 \\ \hline \end{array}$$

$$\begin{array}{r} 120 - \frac{1}{2} \\ \hline \end{array}$$

Ans. 600 cubic in.

## GAUGING.

## Lesson 177.

(1)	(2)	
20	33	
16	26	
—	7	
4	2	
3	3) 14	
—	4 $\frac{2}{3}$	
5) 12	26	3.14
—	30 $\frac{2}{3}$	30 $\frac{2}{3}$
2.4		94.20
16		1.04 $\frac{2}{3}$ — $\frac{1}{3}$
—		1.04 $\frac{2}{3}$ — $\frac{1}{3}$
3.14	2) 30 $\frac{2}{3}$	
18.4	15 $\frac{1}{3}$	96.29 $\frac{1}{3}$
—		15 $\frac{1}{3}$
1256		48 14 5
2512		96 29
314		—
2) 18.4		1444.35
—		32.09 $\frac{7}{8}$ — $\frac{1}{8}$ of 96.29 $\frac{1}{3}$
57.776		.05 $\frac{1}{8}$ — .00 $\frac{1}{8}$ of 15 $\frac{1}{3}$
9.2		2) 1476.49 $\frac{8}{9}$
—		738.24 $\frac{17}{18}$
115552		42
519984		.01
—		.42
2) 5315392		17
265.7696		294
28		42
—		7.14 (.3966
21261568		54 [&c.]
5315392		174
—		162
231) 7441.5488 (32.2 gals.		
693	[Ans. 31006.08	
—	.3966 — $\frac{17}{18}$ 18)	
511	2150.4) 31006.4766 (14.4 bu.	
462	21504 [about, Ans. 162	
—	95024	120
495	86016	108
462	—	120
—	90087	108
33	86016	—
	—	12
	4071	

(3)	(4)
19	22
16	16
<hr/>	<hr/>
3	6
3	3
<hr/>	<hr/>
5) 9	5) 18
<hr/>	<hr/>
1.8	3.6
16	16
<hr/>	<hr/>
17.8	19.6
3.14	3.14
17.8	19.6
<hr/>	<hr/>
2512	1884
2198	2826
314	314
<hr/>	<hr/>
2) 17.8	2) 19.6
<hr/>	<hr/>
8.9	9.8
55.892	61.544
8.9	9.8
<hr/>	<hr/>
503028	492352
447136	553896
<hr/>	<hr/>
2) 497.4388	2) 603.1312
<hr/>	<hr/>
248.7194	301.5656
25	33
<hr/>	<hr/>
12435970	9046968
4974388	9046968
<hr/>	<hr/>
277.274) 6217.9850 (22.4 gals.	282) 9951.6648 (35.28
554548 [about, Ans.	846 35.3 gals.
<hr/>	<hr/>
672505	1491
554548	1410
<hr/>	<hr/>
1179570	816
1109096	564
<hr/>	<hr/>
70474	2526
	2256
	<hr/>
	270

$$\begin{array}{r}
 (5) \\
 36 \\
 28 \\
 \hline
 8 \\
 2 \\
 3) \overline{16} \\
 \hline
 5\frac{1}{3} \\
 28 \\
 33\frac{1}{3} \\
 \hline
 942 \\
 942 \\
 \hline
 103.62 \\
 104.666 \text{ \&c. } - \frac{1}{3} \\
 2) 33\frac{1}{3} \quad \overline{104.6666 \text{ \&c.}} \\
 \hline
 16\frac{2}{3} \quad 16\frac{2}{3} \\
 \hline
 6279999 \text{ \&c.} \\
 1046666 \text{ \&c.} \\
 \hline
 1674.6666 \text{ \&c.} \\
 348888 \text{ \&c. } - \frac{1}{3} \\
 348888 \text{ \&c. } - \frac{1}{3} \\
 2) \overline{1744.4444 \text{ \&c.}} \\
 \hline
 872.2222 \text{ \&c.} \\
 48 \\
 \hline
 69777777 \text{ \&c.} \\
 34888888 \text{ \&c.} \\
 \hline
 41866.6666 \text{ \&c.} \\
 500 \\
 2150.4) \overline{20933333333333} \text{ (9,734.6 bu. about, Ans.} \\
 \hline
 193536 \\
 \hline
 157973 \\
 150528 \\
 \hline
 74453 \\
 64512 \\
 \hline
 99413 \\
 86016 \\
 \hline
 133973 \\
 129024 \\
 \hline
 4949
 \end{array}$$

## Lesson 178.

<p>(1)</p> $\begin{array}{r} 17.8 \\ 16 \\ \hline 1.8 \\ 2 \\ \hline 3) 3.6 \\ \hline 1.2 \\ 16 \\ \hline 17.2 \end{array}$	<p>(2)</p> $\begin{array}{r} 18 \\ 15 \\ \hline \frac{2}{3} \text{ of } 3 \\ \hline 3) 3 \\ \hline 1 \\ 2 \\ \hline 2 \\ 15 \\ \hline 17 \end{array}$
$\begin{array}{r} 314 \\ 17.2 \\ \hline 628 \\ 2198 \\ 314 \\ \hline 2) 17.2 \\ \hline 8.6 \end{array}$	$\begin{array}{r} 314 \\ 17 \\ \hline 2198 \\ 314 \\ \hline 2) 17 \\ \hline 8.5 \end{array}$
$\begin{array}{r} 54.008 \\ 8.6 \\ \hline 324048 \\ 432064 \\ \hline 2) 4644688 \\ \hline 2322344 \\ 8 \\ \hline 231) 1857.8752 \end{array}$	$\begin{array}{r} 53.38 \\ 8.5 \\ \hline 26690 \\ 42704 \\ \hline 2) 453.730 \\ \hline 226865 \\ 14 \\ \hline 907460 \\ 226865 \\ \hline 231) 3176.110 \end{array}$
$\begin{array}{r} 1848 \\ \hline 987 \\ 924 \\ \hline 63 \end{array}$	$\begin{array}{r} 13.7 \text{ gals.} \\ \hline 231 \text{ [about, Ans.]} \\ \hline 866 \\ 693 \\ \hline 1731 \\ 1617 \\ \hline 114 \end{array}$

8 gals. about,  
[Ans.]

(13.7 gals.  
[about, Ans.]

(3)

$\begin{array}{r} 18 \\ 15 \\ \hline \end{array}$			
$\frac{2}{3}$ of 3			
$\begin{array}{r} 3) 3 \\ \hline 1 \\ 2 \\ \hline 2 \\ 15 \\ \hline 17 \end{array}$		$\begin{array}{r} 16 \\ 15 \\ \hline 1 \\ 2 \\ \hline 2 \\ 15\frac{2}{3} \end{array}$	
$\begin{array}{r} 3.14 \\ 17 \end{array}$		$\begin{array}{r} 3.14 \\ 15\frac{2}{3} \\ \hline 1570 \\ 314 \\ \hline 47.10 \\ 1.0466 \text{ \&c. } \frac{1}{8} \\ 1.0466 \text{ \&c. } \frac{1}{8} \end{array}$	
$\begin{array}{r} 2) 17 \\ \hline 53.38 \\ 8.5 \end{array}$		$\begin{array}{r} 2) 15\frac{2}{3} \\ \hline 49.1933 \text{ \&c. } \\ 7\frac{5}{8} \end{array}$	
$\begin{array}{r} 26690 \\ 42704 \end{array}$		$\begin{array}{r} 344.3533 \\ 8.1988 \text{ \&c. } \frac{1}{8} \\ 32.7955 \text{ \&c. } \frac{1}{8} \end{array}$	
$\begin{array}{r} 2) 453.730 \\ \hline 226.865 \\ 29 \end{array}$		$\begin{array}{r} 2) 385.3477 \text{ \&c. } \\ \hline 192.6738 \text{ \&c. } \\ 6 \end{array}$	
$\begin{array}{r} 2041785 \\ 453730 \end{array}$		$\begin{array}{r} 1156.0433 \text{ \&c. } \\ 6 \end{array}$	
$\begin{array}{r} 6579.085 \\ 1156.0433 \end{array}$		$\begin{array}{r} 1156.0433 \text{ \&c. } \end{array}$	
$\begin{array}{r} 277.274) 5423.0416 (19.55 \\ 277274 \end{array}$			
		19.6 gals. nearly, Ans.	
$\begin{array}{r} 2650301 \\ 2495466 \end{array}$			
$\begin{array}{r} 1548356 \\ 1386370 \end{array}$			
$\begin{array}{r} 161986 \\ 138370 \end{array}$			
$\begin{array}{r} 23616 \end{array}$			

[whole cask.  
cubic in. in the  
&c. outs.

(4)

46  
25

21 in. height of hollow space.

36  
26  

---

10  
3  

---

5) 30  

---

6  
26  

---

32      3.14  
32      32

628  
942  
2) 32  

---

16048  
16      16

60288  
10048  

---

2) 1607.68

80384  
46

482304  
321536

36976.64  
15638.3304 outs.

2150.4) 21338.3096 (9.9 bu. about, Ans.

193536

198470

193536

4934

34  
26  

---

8  
3  

---

5) 24  

---

4.8  
26  

---

30.8      3.14  
30.8      30.8

2512  
942  
2) 30.8  

---

15.4      15.4

386848  
483560  
96712

2) 1489.3648

7446824  
21

7446824  
14893648  

---

15638.3304

# TONNAGE OF VESSELS.

## Lesson 179.

$$\begin{array}{r}
 \text{(1)} \\
 \begin{array}{r}
 24 \\
 3 \\
 \hline
 5) 72 \\
 \hline
 14.4 \quad 14.4 \\
 \hline
 70.0 \\
 24 \\
 \hline
 28 \\
 14 \\
 \hline
 1680 \\
 10 \\
 \hline
 95) 16800 \text{ (} 176 \frac{8}{5} \text{ T. Ans.} \\
 95 \\
 \hline
 730 \\
 665 \\
 \hline
 650 \\
 570 \\
 \hline
 80 \\
 8 \frac{2}{5}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 \begin{array}{r}
 36 \\
 3 \\
 \hline
 5) 108 \quad 150 \\
 21.6 \quad 21.6 \\
 \hline
 128.4 \\
 36 \\
 \hline
 7704 \\
 3852 \\
 2) 36 \quad 4622.4 \\
 18 \quad 18 \\
 \hline
 369792 \\
 46224 \\
 \hline
 83203.2 \\
 \text{(Carried up.)}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(2)} \\
 \begin{array}{r}
 27 \\
 3 \\
 \hline
 5) 81 \\
 \hline
 16.2 \quad 106.2 \\
 \hline
 16.2 \quad 16.2 \\
 \hline
 90.0 \\
 27 \\
 \hline
 63 \\
 18 \\
 \hline
 2) 27 \\
 \hline
 13.5 \quad 2430 \\
 \hline
 13.5 \\
 \hline
 1215 \\
 729 \\
 \hline
 243 \\
 95) 32805.0 \text{ (} 345 \frac{8}{5} \text{ T.} \\
 285 \quad \text{[Ans.} \\
 \hline
 430 \\
 380 \\
 \hline
 505 \\
 475 \\
 \hline
 30 \\
 3 \frac{2}{5}
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{(Brought up.)} \\
 95) 83203.2 \text{ (} 875 \frac{8}{5} \text{ T. about,} \\
 760 \quad \text{[Ans.} \\
 \hline
 720 \\
 665 \\
 \hline
 553 \\
 475 \\
 \hline
 78 \\
 8 \frac{2}{5}
 \end{array}$$



(4)

$$\begin{array}{r}
 20 \\
 3 \\
 \hline
 5)60 \\
 \hline
 12 \quad 75 \\
 12 \quad 12 \\
 \hline
 63 \\
 20 \\
 \hline
 1260 \\
 9 \\
 \hline
 \end{array}$$

95)11340(119  $\frac{34}{95}$  T. Ans.

$$\begin{array}{r}
 95 \\
 \hline
 184 \\
 95 \\
 \hline
 890 \\
 855 \\
 \hline
 \frac{34}{95}
 \end{array}$$

(5)

$$\begin{array}{r}
 18.5 \\
 3 \\
 \hline
 5)55.5 \quad 60 \\
 11.1 \quad 11.1 \\
 \hline
 48.9 \\
 18.5 \\
 \hline
 2445 \\
 3912 \\
 489 \\
 \hline
 90465 \\
 7.2 \\
 \hline
 180930 \\
 633255 \\
 95)6513480(68 \frac{32}{95} \text{ T. about,} \\
 570 \quad \text{[Ans.]} \\
 \hline
 813 \\
 760 \\
 \hline
 \frac{53}{95}
 \end{array}$$

(6)

$$\begin{array}{r}
 44 \\
 3 \\
 \hline
 5)132 \\
 26.4 \\
 \hline
 190 \\
 26.4 \\
 \hline
 163.6 \\
 44 \\
 \hline
 6544 \\
 6544 \\
 \hline
 71984 \\
 22 \\
 \hline
 143968 \\
 143968 \\
 95)158364.8(1666.9 \\
 95 \\
 \hline
 633 \\
 570 \\
 \hline
 636 \\
 570 \\
 \hline
 664 \\
 570 \\
 \hline
 940 \\
 855 \\
 \hline
 85
 \end{array}$$

1667 T. nearly, Ans.

# SQUARE ROOT.

## Lesson 182.

<p>(1)</p> $\begin{array}{r} 256(16 \text{ Ans.} \\ 1 \\ \hline 26)156 \\ 156 \end{array}$	<p>(2)</p> $\begin{array}{r} 324(18 \text{ Ans.} \\ 1 \\ \hline 28)224 \\ 224 \end{array}$	<p>(3)</p> $\begin{array}{r} 97476129(9,873 \text{ Ans.} \\ 81 \\ \hline 188)1647 \\ 1504 \\ \hline 1967)14361 \\ 13769 \\ \hline 19743)59229 \\ 59229 \end{array}$
<p>(4)</p> $\begin{array}{r} 1002001(1,001 \text{ Ans.} \\ 1 \\ \hline 2001)002001 \\ 2001 \end{array}$		
<p>(5)</p> $\begin{array}{r} 998001(999 \text{ Ans.} \\ 81 \\ \hline 189)1880 \\ 1701 \\ \hline 1989)17901 \\ 17901 \end{array}$	<p>(6)</p> $\begin{array}{r} 2025(45 \text{ ft. Ans.} \\ 16 \\ \hline 85)425 \\ 425 \end{array}$	<p>(7)</p> $\begin{array}{r} 784(28 \text{ Ans.} \\ 4 \\ \hline 48)384 \\ 384 \end{array}$
<p>(8)</p> $\begin{array}{r} 37 \quad 32 \\ 80 \quad 20 \\ \hline 2960 \quad 640 \\ 2960 \\ 640 \\ \hline 3600(60 \text{ ft. Ans.} \\ 36 \\ \hline 00 \end{array}$	<p>(9)</p> $\begin{array}{r} 4624(68 \text{ Ans.} \\ 36 \\ \hline 128)1024 \\ 1024 \end{array}$	<p>(10)</p> $\begin{array}{r} 2)1250 \\ \hline 625(25 \text{ ft. Ans.} \\ 4 \\ \hline 45)225 \\ 225 \end{array}$

## Lesson 184.

(1)	(2)
.0081 (.09 Ans. 81	628.1950 (25.0638 about, 4 [Ans.
(3)	45) 228 225
895372 (946.2409 81 946.241 nearly, [Ans.	5006) 31950 30036
184) 853 736	50123) 191400 150369
1886) 11772 11316	501268) 4103100 4010144
18922) 45600 37844	92956
189244) 775600 756976	(4)
18924809) 186240000 170323281 15916719	144(12 1
	22) 44 44
	256(16 $1\frac{1}{2}$ or $\frac{3}{4}$ Ans. 1
	26) 156 156
(5)	(6)
$\frac{3}{16}$	98 $\frac{1}{4}$
16) 3.0 (.1875 .1875(.433 about, 16 [Ans.	or 98.25 (99.12 about, 81 [Ans.
140 128	83) 275 249
120 112	863) 2600 2589
80 80	11
	189) 1725 1701
	1981) 2400 1981
	19822) 41900 39644
	2256

$$\begin{array}{r}
 \text{(7)} \\
 6.25 \text{ (2.5 Ans.} \\
 \underline{4} \\
 45) 225 \\
 \underline{225} \\
 \\
 \text{(9)} \\
 61322 \\
 \underline{3} \\
 4) 183966 \\
 \underline{4} \\
 45991.50 \text{ (214.456 ft. wide} \\
 \underline{4} \text{ about.} \\
 41) 59 \quad 3) 857.824 \\
 \underline{41} \quad \underline{285.941} \text{ ft. long} \\
 424) 1891 \quad \text{about.} \\
 \underline{1696} \\
 4284) 19550 \\
 \underline{17136} \\
 42885) 241400 \\
 \underline{214425} \\
 428906) 2697500 \\
 \underline{2573436} \\
 124064
 \end{array}$$

$$\begin{array}{r}
 \text{(8)} \\
 5) 2672.05 \\
 \underline{53441} \text{ (23.117 ft. wide} \\
 \underline{4} \text{ about.} \\
 43) 134 \quad 115.585 \text{ ft. long} \\
 \underline{129} \text{ about.} \\
 461) 541 \\
 \underline{461} \\
 4621) 8000 \\
 \underline{4621} \\
 46227) 337900 \\
 \underline{323589} \\
 14311
 \end{array}$$

$$\begin{array}{r}
 \text{(10)} \\
 .000480 \text{ (.0219 about, Ans.} \\
 \underline{4} \\
 41) 80 \\
 \underline{41} \\
 429) 3900 \\
 \underline{3861} \\
 39
 \end{array}$$

$$\begin{array}{r}
 \text{(11)} \\
 20.25 \\
 \underline{20.25} \\
 10125 \\
 \underline{4050} \\
 4050 \\
 3) 410.0625 \text{ Ans.} \\
 \underline{1366875} \text{ (11.691 ft. breadth about.} \\
 \underline{1} \quad \underline{3} \\
 21) 36 \quad 35.073 \text{ ft. length about.} \\
 \underline{21} \\
 226) 1568 \\
 \underline{1356} \\
 2329) 21275 \\
 \underline{20961} \\
 23381) 31400 \\
 \underline{23381} \\
 8019
 \end{array}$$

## Lesson 185.

(1)

$$\begin{array}{r}
 18 \quad 15 \\
 18 \quad 15 \\
 \hline
 144 \quad 75 \\
 18 \quad 15 \\
 \hline
 324 \quad 225 \\
 \\
 324 \\
 225 \\
 \hline
 549 \text{ ( } 23.4307 \\
 4 \text{ } 23.431 \text{ ft. nearly, Ans.} \\
 \hline
 43 \overline{)149} \\
 \underline{129} \\
 200 \\
 464 \overline{)2000} \\
 \underline{1856} \\
 14400 \\
 4683 \overline{)14400} \\
 \underline{14049} \\
 3510000 \\
 468607 \overline{)3510000} \\
 \underline{3280249} \\
 229751
 \end{array}$$

(3)

$$\begin{array}{r}
 20 \quad 16 \\
 20 \quad 16 \\
 \hline
 400 \quad 96 \\
 \quad 16 \\
 \hline
 400 \quad 256 \\
 256 \quad 256 \\
 \hline
 144 \text{ (12 ft. Ans.} \\
 1 \\
 \hline
 22 \overline{)44} \\
 \underline{44}
 \end{array}$$

(2)

$$\begin{array}{r}
 24 \quad 18 \\
 24 \quad 18 \\
 \hline
 96 \quad 144 \\
 48 \quad 18 \\
 \hline
 576 \quad 324 \\
 \\
 576 \\
 324 \\
 \hline
 900 \text{ (30 ft. Ans.} \\
 9 \\
 \hline
 6)00
 \end{array}$$

(4)

$$\begin{array}{r}
 25 \quad 15 \\
 25 \quad 15 \\
 \hline
 125 \quad 75 \\
 50 \quad 15 \\
 \hline
 625 \quad 225 \\
 \\
 625 \\
 225 \\
 \hline
 400 \text{ (20 ft. Ans.} \\
 4 \\
 \hline
 4)00
 \end{array}$$

(5)

$$\begin{array}{r}
 40 \quad 36 \\
 40 \quad 36 \\
 \hline
 1600 \quad 216 \\
 \quad 108 \\
 \hline
 1600 \quad 1296 \\
 1296 \\
 \hline
 2896 (53.814 \text{ rods about, Ans.} \\
 25 \\
 103 \overline{)396} \\
 \quad 309 \\
 \hline
 1068 \overline{)8700} \\
 \quad 8544 \\
 \hline
 10761 \overline{)15600} \\
 \quad 10761 \\
 \hline
 107624 \overline{)483900} \\
 \quad 430496 \\
 \hline
 \quad \quad 53404
 \end{array}$$

(6)

$$\begin{array}{r}
 6 \quad 8 \\
 6 \quad 8 \\
 \hline
 36 \quad 64 \\
 \hline
 36 \\
 64 \\
 \hline
 100 (10 \text{ ft. Ans.} \\
 1 \\
 \hline
 2 \overline{)00}
 \end{array}$$

(7)

$$\begin{array}{r}
 2 \overline{)24} \\
 \hline
 12 \quad 12 \\
 12 \quad 12 \\
 \hline
 24 \quad 24 \\
 12 \quad 12 \\
 \hline
 144 \quad 144 \\
 \hline
 144 \\
 144 \\
 \hline
 288 (16.97 \text{ ft. about, Ans.} \\
 1 \\
 \hline
 26 \overline{)188} \\
 \quad 156 \\
 \hline
 329 \overline{)3200} \\
 \quad 2961 \\
 \hline
 3387 \overline{)23900} \\
 \quad 23709 \\
 \hline
 \quad \quad 191
 \end{array}$$

(8)

A.	qr.	sq. rods.
2	1	32
4		
8		
1		
9		
40		
360		
32		
392	sq. rods ; the square of	
2	[one side of the field.	
784	(28 rods. Ans.	
4		
48		
384		
384		

(9)

$$\begin{array}{r}
 16 \\
 16 \\
 \hline
 96 \\
 16 \\
 \hline
 2) 256
 \end{array}$$

1'28 (1 1.3 in. square about,  
1 [Ans.]

$$\begin{array}{r}
 21) 28 \\
 21 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 223) 700 \\
 669 \\
 \hline
 31
 \end{array}$$

(10)

$$\begin{array}{r}
 20 \quad 12 \\
 20 \quad 12 \\
 \hline
 400 \quad 24 \\
 \quad 12 \\
 \hline
 400 \quad 144 \\
 144 \quad 144
 \end{array}$$

2'56 (16 ft. Ans.  
1

$$\begin{array}{r}
 26) 156 \\
 156
 \end{array}$$

## CUBE ROOT.

## Lesson 188.

(1)

$$\begin{array}{r}
 2197(13 \quad 10 \\
 1 \quad [Ans. \quad 10 \\
 \hline
 300) 1197 \quad 100 \\
 1197 \quad 3 \\
 \hline
 300 \\
 300 \\
 3 \\
 \hline
 900 \quad 30 \quad 9 \text{ square of} \\
 9 \quad 3 \quad [units. \\
 \hline
 900 \quad 270 \quad 27 \text{ cube of} \\
 270 \quad [units. \\
 27 \\
 \hline
 1197
 \end{array}$$

(2)

$$\begin{array}{r}
 15625(25 \quad 20 \\
 8 \quad [Ans. \quad 20 \\
 \hline
 1200) 7625 \quad 400 \\
 7625 \quad 3 \quad 20 \\
 \hline
 1200 \quad 3 \\
 1200 \quad 60 \quad 5 \\
 5 \quad 25 \quad 5 \\
 \hline
 6000 \quad 30 \quad 25 \\
 12 \quad 5 \\
 \hline
 6000 \quad 1500 \quad 125 \\
 1500 \\
 125 \\
 \hline
 7625
 \end{array}$$

$$\begin{array}{r} \textbf{(3)} \\ 9261(21 \quad 20 \\ 8 \quad \text{[Ans.} \quad 20 \\ \hline 1200)1261 \quad 400 \\ 1261 \quad 3 \\ \hline 1200 \\ \\ 1200 \\ 60 \\ 1 \\ \hline 1261 \end{array}$$

$$\begin{array}{r}
 \text{(4)} \\
 2924207(143 \quad 10 \\
 1 \quad \text{[Ans.} \quad 10 \\
 \hline
 300)1924 \quad \quad \quad 100 \\
 \underline{1744} \quad \quad \quad 3 \\
 \hline
 58800)180207 \quad \quad \quad 300 \quad 30 \quad 4 \\
 \underline{180207} \quad \quad \quad 16 \quad 4 \\
 \quad \quad \quad 300 \quad 18 \quad 16 \\
 \quad \quad \quad 4 \quad 3 \quad 4 \\
 \hline
 \quad \quad \quad 1200 \quad 480 \quad 64 \\
 \quad \quad \quad 480 \\
 \quad \quad \quad 64 \\
 \hline
 \quad \quad \quad 1744
 \end{array}$$

(5)

729.000(90 Ans.

729

---

000

140		
140		
<hr/>		
56		
14		
<hr/>		
19600		
3		
<hr/>		
58800	140	3
	3	3
	<hr/>	
58800	420	9
3	9	3
<hr/>	<hr/>	<hr/>
176400	3780	27
3780		
27		
<hr/>		
180207		

[illegible]

50		
50		
<hr/>	50	
2500	3	
3	<hr/>	
<hr/>	150	4
7500	16	4
	<hr/>	<hr/>
7500	90	16
4	15	4
<hr/>	<hr/>	<hr/>
30000	2400	64
2400		
64		
<hr/>		
32464		
(Carried over.)		



(Brought over.)

$$\begin{array}{r}
 540 \\
 540 \\
 \hline
 216 \\
 270 \\
 291600 \\
 \quad 3 \\
 874800 \\
 \quad 3 \\
 874800 \\
 \quad 7 \\
 6123600 \\
 \quad 79380 \\
 \quad \quad 343 \\
 \hline
 6203323
 \end{array}$$

$$\begin{array}{r}
 5470 \\
 5470 \\
 \hline
 3829 \\
 2188 \\
 2735 \\
 29920900 \\
 \quad 3 \\
 89762700 \\
 \quad 3 \\
 89762700 \\
 \quad 7 \\
 628338900 \\
 \quad 804090 \\
 \quad \quad 343 \\
 \hline
 629143333
 \end{array}$$

$$\begin{array}{r}
 54770 \\
 54770 \\
 \hline
 38339 \\
 38339 \\
 21908 \\
 27385 \\
 2999752900 \\
 \quad 3 \\
 8999258700 \\
 8999258700 \\
 \quad 7 \\
 62994810900 \\
 \quad 8051190 \\
 \quad \quad 343 \\
 \hline
 63002862433
 \end{array}$$

$$\begin{array}{r}
 54770 \\
 3 \\
 164310 \\
 \quad 49 \\
 147879 \\
 65724 \\
 8051190 \\
 343
 \end{array}$$

$$\begin{array}{r}
 1728(12 \text{ in.} \\
 1 \text{ [Ans.} \\
 300)728 \\
 \quad 728 \\
 \hline
 10 \\
 10 \\
 100 \\
 3 \\
 300 \\
 300 \\
 2 \quad 30 \\
 600 \quad 4 \\
 120 \quad 120 \\
 8 \\
 \hline
 728
 \end{array}$$

$$\begin{array}{r}
 (8) \\
 \text{min.} \\
 60 \\
 60 \\
 \hline
 3600 \text{ sec.} \\
 60 \\
 \hline
 216000(60 \text{ ft. Ans.} \\
 216 \\
 \hline
 000
 \end{array}$$

(9)

13824(24 in. square	20		
8	[Ans. 20		
1200)5824	400	20	
5824	3	3	
	1200	60	4
		16	4
	1200	36	16
	4	6	4
	4800	960	64
	960		
	64		
	5824		

(10)

110592(48 ft. Ans.	40		
64	40		
4800)46592	1600	40	
46592	3	3	
	4800	120	8
		64	8
	4800	48	64
	8	72	8
	38400	7680	512
	7680		
	512		
	46592		

**Lesson 190.**

(1)

.000825(.0938 nearly,	90		
729	[Ans. 90		
24300)96000	8100		
75357	3		
2594700)20643000	24300	90	3
		3	3
	24300	270	9
	3	9	3
	72900	2430	27
	2430		
	27		
	75357		
	930		
	930		
	279		
	837		
	864900		
	3		
	2594700		

(2)

27980(3.036 nearly, Ans.	30			
27	30			
2700) 980	900			
270000) 980000	3			
818127	2700			
27542700) 161873000	270000	300	3	
		3	3	
	270000	900	9	
	3	9	3	
	810000	8100	27	
	8100			
	27			
	818127			
	3030			
	3030			
	909			
	909			
	9180900			
	3			
	27542700			

(3)

1601618(117 about, Ans.	10			
1	10			
300) 601	100	10		
331	3	3		
36300) 270618	300	30	1	
270613	30			
5	1			
	331			
	110			
	110			
	11			
	11			
	12100	110		
	3	3		
	36300	330	7	
		49	7	
	36300	297	49	
	7	132	7	
	254100	16170	343	
	16170			
	343			
	270613			

**CUBE ROOT.**

205

(4)

512  
2197

$$\begin{array}{l} \sqrt[8]{\text{cube root of numerator.}} \\ \sqrt[13]{\text{cube root of denominator.}} \end{array} \} \text{Ans.}$$

2197(13	10		
1	10		
<hr/>	<hr/>		
300)1197	100		
1197	3		
<hr/>	<hr/>		
	300	10	3
		3	3
	<hr/>	<hr/>	<hr/>
	300	30	9
	3	9	3
	<hr/>	<hr/>	<hr/>
	900	270	27
	270		
	27		
	<hr/>		
	1197		

**(5)**

**7**  
**29**

**2|0)|7**

**.35**

**.350(.70472 or .7047 about, 70**  
**343 [Ans. 70**

14700)7000	4900	700	
<u>          </u>	<u>3</u>	<u>3</u>	
1470000)7000000			
5913664	14700	2100	4
<u>          </u>		<u>16</u>	<u>4</u>
148684800)1086336000	1470000		
1041828823	1470000	126	16
<u>          </u>	<u>4</u>	<u>21</u>	<u>4</u>
14898062700)44507177000			
	5880000	33600	64
	33600		
	<u>64</u>		
	<u>5913664</u>		

(Carried over.)

CUBE ROOT.

(Brought over.)

7040		
7040		
<hr/>		
2816		
4928		
<hr/>		
49561600	7040	
3	3	
<hr/>		
148684800	21120	7
	49	7
<hr/>		
148684800	19008	49
7	8448	7
<hr/>		
1040793600	1034880	343
1034880		
343		
<hr/>		
1041828823		

70470
70470
<hr/>
49329
28188
49329
<hr/>
4966020900
3
<hr/>
14898062700

(6)

88 1 $\frac{1}{2}$	90		
or 88 1.333 &c. (9.5876	90	90	
729 9.588 nearly,		3	
[Ans.	8100		
	3	270	5
24300) 152333	12300	25	5
128375	24300		
<hr/>			
2707500) 23958333	5	135	25
21842912		54	5
<hr/>			
275329200) 2115421333	121500	6750	125
1928713003	6750		
<hr/>			
27573170700) 186708330333	125		
	128375		

(Carried over.)

(Brought over.)

950		
950		
<hr/>		
475		
855		
<hr/>		
902500	950	
3	3	
<hr/>		
2707500	2850	8
	64	8
<hr/>		
2707500	1140	64
8	1710	8
<hr/>		
21660000	182400	512
182400		
512		
<hr/>		
21842912		
<hr/>		
9580		
9580		
<hr/>		
7664		
4790		
8622		
<hr/>		
91776400	9580	
3	3	
<hr/>		
275329200	28740	7
	49	7
<hr/>		
275329200	25866	49
7	11496	7
<hr/>		
1927304400	1408260	343
1408260		
343		
<hr/>		
1928713003		
<hr/>		
95870		
95870		
<hr/>		
67109		
76696		
47935		
86283		
<hr/>		
9191056900		
3		
<hr/>		
27573170700		

## CUBE ROOT.

$$\begin{array}{r}
 (7) \\
 314159 \\
 \underline{7920} \\
 628318 \\
 2827431 \\
 \underline{2199113} \\
 2488139280 \\
 \underline{7920} \\
 497627856 \\
 2239325352 \\
 \underline{1741697496} \\
 2)7920 \quad 19706063097600 \\
 \underline{3960} \quad \quad \quad 3960 \\
 1182363785856 \\
 1773545678784 \\
 \underline{591181892928} \\
 3)78036009866496000 \\
 26012003288832000 (6383.5 \text{ nearly.} \\
 \underline{216} \quad \quad \quad \text{or } 6383\frac{1}{2} \text{ miles sq.,} \\
 10800)44120 \quad \quad \quad \text{[nearly, Ans.} \\
 \underline{34047} \\
 1190700)10073032 \\
 \underline{9647072} \\
 122113200)425960888 \quad 60 \\
 \underline{366511887} \quad 60 \\
 12222806700)59449001320 \quad 3600 \\
 \quad \quad \quad 3 \\
 \hline
 10800 \quad 60 \quad 3 \\
 \quad \quad 3 \quad 3 \\
 \hline
 10800 \quad 180 \quad 9 \\
 \quad \quad 3 \quad 3 \\
 \hline
 32400 \quad 1620 \quad 27 \\
 \quad 1620 \\
 \quad \quad 27 \\
 \hline
 34047
 \end{array}$$

• (Carried over.)

(Brought over.)

630		
630		
<hr/>		
189		
378		
<hr/>		
396900	630	
3	3	
<hr/>		
1190700	1890	8
	64	8
<hr/>		
1190700	756	64
8	1134	8
<hr/>		
9525600	120960	512
120960		
512		
<hr/>		
9647072		
<hr/>		
6380		
6380		
<hr/>		
5104		
1914		
3828		
<hr/>		
40704400		
3		
<hr/>		
122113200	6380	3
	3	3
<hr/>		
122113200	19140	9
3	9	3
<hr/>		
366339600	172260	27
172260		
27		
<hr/>		
366511887		
<hr/>		
63830		
63830		
<hr/>		
19149		
51064		
19149		
38298		
<hr/>		
4074268900		
3		
<hr/>		
12222806700		



(8)

2) 13.718	Ans.			
<u>6.859</u>	(1.9 ft. breadth or	10		
1	2 [depth.	10		
<u>300) 5859</u>	3.8 ft. length.	100		
5859		3		
		<u>300</u>	10	9
			3	9
		300	30	81
		9	81	9
		<u>2700</u>	<u>2430</u>	<u>729</u>
		2430		
		729		
		<u>5859</u>		

(9)

81				
<u>9</u>				
8) 729				
<u>91.125</u> (	4.5 in. or $4\frac{1}{2}$ in. sq.	40		
64	8 [at the base.	40		
<u>4800) 27125</u>	9) 36.0	1600	40	
27125		3	3	
	4 in. high.	<u>4800</u>	120	5
			25	5
		4800	60	25
		5	24	5
(10)	(11)	<u>24000</u>	<u>3000</u>	<u>125</u>
.00064 (.04 Ans.	4	3000		
64	6	125		
	<u>24</u>	<u>27125</u>		
	21 $\frac{1}{2}$			
	<u>24</u>			
	48			
	8 — $\frac{1}{2}$			
	<u>512</u> (8 ft. square, Ans.			
	512			



(Brought over.)

13560 oz. in 1 cubic ft.

197½

9492

12204

1356

2671320

½ . . 4520

16

1728)2675840(1548.5(96 lbs.

1728

144

9478

108

8640

96

8384

12.5

6912

or 12½ oz.

14720

13824

8960

8640

320

(4)

73|00)584|00(8(2 ft. square, Ans.

584

8

(5)

3.14159

4

12.56636

2

2)25.13272

12.56636 surface of base.

7

3)87.96452

29.3215

2700 oz. in 1 cubic ft.

2052505

586430

16)79168.0500(4,948 lbs.

64

[about, Ans.

151

144

76

64

128

128

(6)

8

4

32

2

64

1000

64000

oz. in 1 cubic ft. 2000

16

1728)128000000(74074(4,629 lbs.

12096

64

7040

100

6912

96

12800

47

12096

32

7040

154

6912

144

128

10 oz

		(7)		
		45 fath.		
		6		
$\frac{1}{2}$ diam.	5	270 ft.		
$\frac{1}{8}$ rad.	5	12		
	<u>25</u>	<u>54</u>		
		27		
$2\frac{1}{8}$ divided by 2		<u>3240 in.</u>		
or $2\frac{1}{8}$ sq. in., sur-		25		
[face of end.		<u>1620</u>		
		648		
		<u>12) 81000 (6750</u>	cubic in.	
		72	$47\frac{1}{2}$ cubic ft.	
		<u>90</u>	6750	
		84	1100 oz. in 1 cubic ft.	
		<u>60</u>	675	
		60	<u>675</u>	
		<u>0</u>	16	
			1728) 7425000 (4296.87 (268 lbs.	
			<u>6912</u>	
			32	
			<u>5130</u>	
			109	
			<u>3456</u>	
			96	
			<u>16740</u>	
			136	
			<u>15552</u>	
			128	
			<u>11880</u>	
			8.87 oz.	
			10368	
			[or 9 oz. nearly.	
			<u>15120</u>	
			13824	
			<u>52359833 &amp;c.</u>	
			930 oz. in 1 cubic ft.	
			12960	
			<u>157079499</u>	
			12096	
			<u>471238497</u>	
			864	
			<u>16) 48094644690 (30 lbs.</u>	
			48	
			<u>6.9 oz. about.</u>	

(9)

$$\begin{array}{r}
 21 \\
 18 \\
 \hline
 3 \\
 2 \\
 \hline
 3) 6 \\
 \hline
 2 \\
 18 \\
 \hline
 20
 \end{array}$$

$$\begin{array}{r}
 3.14 \\
 20 \\
 \hline
 2) 20 \\
 \hline
 10 \\
 \hline
 62.80 \\
 10 \\
 \hline
 2) 628.00 \\
 \hline
 314 \\
 36 \\
 \hline
 1884 \\
 942 \\
 \hline
 \end{array}$$

11304 cubic in. or  $\frac{11304}{1728}$  cubic ft.  
 1030 oz. in 1 cubic ft.

$$\begin{array}{r}
 33912 \\
 11304 \\
 \hline
 1728) 11643120 \quad \overline{16} \\
 10368 \quad 64 \\
 \hline
 12751 \quad 33 \\
 12096 \quad 32 \\
 \hline
 6552 \quad 17 \\
 5184 \quad 16 \\
 \hline
 13680 \quad 1 \\
 12096 \\
 \hline
 1584
 \end{array}$$

(421 lbs. about. Ans.)

(10)

$$\begin{array}{r}
 3.14159 \\
 \underline{5} \\
 2) 5 \quad 15.70795 \\
 \underline{2.5} \quad 2.5 \\
 7853975 \\
 3141590 \\
 2) 39269875 \\
 \underline{19.6349375} \\
 19.6349375 \\
 12.56636 \\
 \underline{12} \quad 100 \\
 1200 \text{ in.} \\
 \text{[length.} \\
 7.0685775 \text{ square in. in end of pipe.} \\
 1200 \\
 141371550 \\
 70685775 \\
 84822930000 \text{ cubic in. or } \frac{8482293}{1728} \text{ cubic ft.} \\
 7210 \text{ oz. in 1 cubic ft.} \\
 8482293 \\
 16964586 \\
 59376051 \\
 16 \\
 1728) 61157332530 (3539.19 (2211.9 \text{ lbs.} \\
 5184 \quad 32 \text{ or } 2,212 \text{ lbs. nearly. Ans.} \\
 9317 \quad 33 \\
 8640 \quad 32 \\
 6773 \quad 19 \\
 5184 \quad 16 \\
 15893 \quad 31 \\
 15552 \quad 16 \\
 3412 \quad 159 \\
 1728 \quad 144 \\
 16845 \quad 11 \\
 15552 \\
 1323
 \end{array}$$

## Lesson 192.

(1)

oz.	oz.	dr.	
36	33	7 $\frac{2}{10}$	16) 7.2 (.45
6	6		64
<hr/>	<hr/>		<hr/>
30	27		80
			80

oz.
3 0) 2 7.45
<hr/>
.915 Ans.

(2)

oz.	oz.	dr.	
20	33	7	16) 7.0 (.4375
4	4		64
<hr/>	<hr/>		<hr/>
16	29		60
			48
	oz.		
	16) 29.4375 (1.8398		120
	16	1.840 near-	112
	<hr/>	[ly, Ans.	<hr/>
	134		80
	128		80
	<hr/>		
	63		
	48		
	<hr/>		
	157		
	144		
	<hr/>		
	135		
	128		
	<hr/>		
	7		

(3)

1 length.
.5 breadth.
<hr/>
.5
.25 thickness.
<hr/>
25
10
<hr/>
2) .125
<hr/>
.0625 cubic ft.
1000
<hr/>

625 000 oz. weight of .0625 cubic ft. of water.

62.5) 35.00 ( .560 Ans.
3125
<hr/>
3750
3750

(4)

98) 1728 (17.6326 times 98	17.6326	17.6326
98 [in. in a cubic ft.	30 grs.	2 grs.
<hr/>	<hr/>	<hr/>
748	528.9780	35.2652
686	Air 529 grs. [nearly.	Hydrogen gas 35.27 grs. [nearly.
<hr/>		
620		
588		
<hr/>		
320	16) 1000 ( 62.5 lbs. in 1,000 oz.	
294	96 7000 grs. in a lb.	
<hr/>		
260	40 437500.0 grs. in 1,000 oz. or cubic	
196	32 [ft. of water.	
<hr/>		
640	80	
588	80	
<hr/>		
52		

437500) 528.978 (.001209	437500) 35.26520 (.00008 about.
437500 .00121 nearly.	3500000
<hr/>	<hr/>
914780	26520
875000	
<hr/>	
3978000	
3937500	
<hr/>	
40500	

(5)	(6)
17800	1000
8790	920
<hr/>	<hr/>
19260	920
17800	840
<hr/>	<hr/>
Ans. 9,010 of gold, to 1,460 of [copper.	80 of alcohol, to 80 of water, or ½ a gal. of each, Ans.
(7)	(8)
.840	920
10	890
<hr/>	<hr/>
8.400	1000
6.000	920
<hr/>	<hr/>
8.400	30 of water to 80 of rum.
6.000	The water must then be ¾ or ¾ of the rum.
<hr/>	¾ of 4 is ¾ or 1½ gal., Ans.
16) 14400 (.900 Ans.	
144	
<hr/>	
00	



**Lesson 193.**

(1)

216	18.000	19.360
204	10.510	18.000

12)216(18 specific gravity. 7.490 of gold, and 1.360 of silver.

12	7.490
96	1.360
96	8.850

It contains  $1\frac{36}{85}$  times 216 grs. of silver.

136
216
816
136
272

216
33

8.85) 293.76 (33 grs. of silver about, and 183 grs. of [gold about.

2826
2655
171

(2)

956.25
300
656.25
437.5

1093.75) 437.500 (.400 Ans.  
437500

(3)

180
16
108
18

1000) 2880  
Ans. 2.880

# THE LEVER.

## Lesson 196.

$$\begin{array}{r} \text{(1)} \\ \frac{1}{10} \text{ of } 2000 \\ 10 \overline{)2000} \\ \text{Ans. } 200 \text{ lbs.} \end{array}$$

$$\begin{array}{r} \text{(2)} \\ \frac{50}{720} \text{ of } 12 \text{ ft.} \\ 12 \overline{)50} \\ 600 \\ 12 \overline{)600} \\ 12 \\ 6 \\ 720 \overline{)7200} \text{ (10 in. from the} \\ 720 \text{ [fulcrum, Ans.} \\ 0 \end{array}$$

$$\begin{array}{r} \text{(3)} \\ 15 \\ 1.5 \\ \hline 13.5 \\ 13.5 \text{ times } 90 \\ 15 \\ 90 \\ \hline 1350.0 \text{ (100 lbs.} \\ 135 \text{ [Ans.} \\ 00 \end{array}$$

(4)  
The short part of the lever must be  $\frac{150}{1500}$  or  $\frac{1}{10}$  [of the long part.  
Both parts then are  $\frac{1}{10}$  and  $\frac{1}{10}$ , or  $\frac{1}{10}$  of the long [part.  
11)11 (1 ft. from the end, being  $\frac{1}{10}$  of the [long part, Ans.

$$\begin{array}{r} \text{(5)} \\ \frac{3}{14} \text{ of } 933\frac{1}{3} \\ 933\frac{1}{3} \\ 3 \\ \hline 2799 \\ 1 - \frac{1}{3} \\ \hline 14 \overline{)2800} \text{ (200 lbs.} \\ 28 \text{ [Ans.} \\ 00 \end{array}$$

$$\begin{array}{r} \text{(6)} \\ \frac{145}{900} \text{ of } 10 \text{ ft.} \\ 145 \\ 10 \\ \hline 900 \overline{)1450} \text{ (1 ft.} \\ 900 \\ \hline 550 \\ 12 \\ \hline 110 \\ 55 \\ \hline 6600 \text{ (} 7\frac{1}{3} \text{ in.} \\ 6300 \end{array}$$

$$\begin{array}{r} \text{(7)} \\ 12 \\ 3 \\ \hline 36 \text{ in.} \\ \frac{36}{2} \text{ of } 4 \\ \text{or } 18 \text{ times } 4 \\ 18 \\ 4 \\ \hline \text{Ans. } 72 \text{ lbs.} \end{array}$$

$$\begin{array}{r} \text{(8)} \\ \frac{5.6}{4} \text{ of } 1\frac{1}{2} \text{ inches.} \\ \text{or } 14 \text{ times } 1\frac{1}{2} \\ 14 \\ 1\frac{1}{2} \\ \hline 14 \\ 7 - \frac{1}{2} \\ \hline 12 \overline{)21} \text{ (1 ft.} \\ 12 \\ \hline 9 \text{ in.} \end{array}$$

$$\frac{300}{300} \text{ or } \frac{3}{3} \text{ or } \frac{1}{1}$$

## THE WHEEL AND AXLE.

## Lesson 197.

$$\begin{array}{r} (1) \\ \frac{1}{8} \text{ of } 350 \end{array}$$

$$\begin{array}{r} 350 \\ .5 \\ \hline \end{array}$$

$$6) 175.0$$

$$\begin{array}{r} 29 \frac{1}{8} \text{ lbs.} \quad 6) 16 \end{array}$$

$$\text{Ans. } 29 \text{ lbs. } 2 \frac{2}{3} \text{ oz.} \quad 2 \frac{1}{8} \text{ or } 2 \frac{2}{3} \text{ oz.}$$

$$(2)$$

$$\begin{array}{r} 12 \\ 7 \text{ ft.} \\ \hline \end{array}$$

$$84$$

$$\frac{3}{4} \text{ of } 12$$

$$84$$

$$12$$

$$168$$

$$84$$

$$9) 1008$$

$$\text{Ans. } 112 \text{ lbs.}$$

$$(3)$$

$$\frac{500}{400} \text{ of } 1$$

$$4) 0) 50|0$$

$$12.5$$

$$\text{or } 12 \frac{1}{2} \text{ ft. Ans.}$$

$$(4)$$

$$\frac{30}{270} \text{ of } 9$$

$$\text{or } \frac{3}{27} \text{ or } \frac{1}{9} \text{ of } 9$$

$$\text{or } 1 \text{ ft. Ans.}$$

$$(5)$$

The first wheel is 10 times the first axle, and the second wheel is 10 times the second axle.

$$10$$

$$10$$

$$100$$

$$25$$

$$\text{Ans. } 2,500 \text{ lbs.}$$

$$(6)$$

$$12$$

$$9 \text{ ft.}$$

$$108$$

$$10 \frac{2}{3} \text{ times } 38$$

$$38$$

$$108$$

$$304$$

$$38$$

$$10.8) 4104.0 \quad (380 \text{ lbs., weight the power will balance.})$$

$$324$$

$$864$$

$$864$$

$$0$$

## THE PULLEY.

## Lesson 198.

(1)  

$$\begin{array}{r} 80 \\ 4 \\ \hline \end{array}$$
 320 lbs.  
 [Ans.]

(2)  
 By drawing a figure we see that the weight is here supported by 7 ropes.  

$$\begin{array}{r} 7) 420 \\ \hline \end{array}$$
 Ans. 60 lbs.

(3)  

$$\begin{array}{r} 8) 5000 \\ \hline \end{array}$$
 625 lbs. supported  
 [by each rope.  
 $\frac{2}{3}$  times 625  
 or .1 of 625  
 or  $62\frac{1}{2}$  lbs. Ans.]

(4)  

$$\begin{array}{r} 6) 360 \\ \hline \end{array}$$
 60 lbs. power will balance 360 lbs., and is  $\frac{2}{3}$  of the power expended since 30 is  $\frac{1}{3}$   $\frac{1}{3}$  is lost.  

$$\begin{array}{r} 30 \\ 60 \\ \hline \end{array}$$
 90 lbs. Ans.

(5)  
 By drawing a figure we see that the weight is here supported by 5 ropes.  

$$\begin{array}{r} 50 \\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} 3) 250 \\ \hline \end{array}$$
 $83\frac{1}{3}$  lbs.,  $\frac{1}{3}$  of 250 lbs.  

$$\begin{array}{r} 250 \\ 83\frac{1}{3} \\ \hline \end{array}$$
 Ans.  $166\frac{2}{3}$  lbs.

(6)  

$$\begin{array}{r} 3) 30 \\ \hline \end{array}$$
 10 lbs.  $\frac{1}{3}$  of 30  

$$\begin{array}{r} 30 \\ 10 \\ \hline \end{array}$$

$$\begin{array}{r} 2) 0) 20 | 0 \\ \hline \end{array}$$

10 ropes to support the weight, and by drawing a figure we see there must be 5 movable pulleys. Ans.

## THE INCLINED PLANE.

## Lesson 199.

(1)	(2)	(3)	(4)
$\frac{2}{3}$ of 12	$\frac{5}{25}$ or $\frac{1}{5}$ of 600	$\frac{100}{75}$ of 39	$\frac{12}{100}$ of 6000
12	5)600	39	12
8		100	6000
—	Ans. 120 lbs.	—	9)07200 0
3)96		975)3900(4 ft.	800 lbs. will
—		3900 [Ans.	balance
Ans. 32 lbs.			[the weight with-
			out any pulleys.
			8)800
			Ans. 100 lbs.

## THE SCREW.

## Lesson 200.

(1)	(2)
12	36
4 ft.	2
—	—
48	72 in. diam.
2	—
—	3.14159
96 in. diam.	96
3,14159	628318
—	2199113
1884954	—
2827431	5)4
—	.8
30159264 circum.	226.19448
40	times
12063.70560	[1500 lbs.
Ans. 12,063.7 lbs.,	
[about.	
	226.19448)1200.00000(
	113097240
	—
	69027600
	67858344
	—
	116925600
	113097240
	—
	3828360

(3)

$$\begin{array}{r}
 12 \\
 6 \\
 \hline
 72 \\
 2 \\
 \hline
 144 \text{ in. diam.}
 \end{array}
 \begin{array}{r}
 3.14159 \\
 144 \\
 \hline
 1256636 \\
 1256636 \\
 \hline
 314159
 \end{array}$$

7540 of 45238896 in. 3.14159 20.00000 ( 6.36 diam.

$$\begin{array}{r}
 45238896 \\
 25 \\
 \hline
 226194480 \\
 90477792 \\
 \hline
 1130972400
 \end{array}
 \begin{array}{r}
 15000000 \\
 1884954 \\
 \hline
 1150460 \\
 942477 \\
 \hline
 2079830 \\
 1884954 \\
 \hline
 194876
 \end{array}$$

7540) 1130972400 (1.5 in. nearly,  
 7540  
 37697  
 37700

or 1½ in. nearly,  
 [Ans.

(5)

$$\begin{array}{r}
 12 \\
 5 \text{ ft.} \\
 \hline
 60 \\
 2 \\
 \hline
 120 \text{ in. diam.}
 \end{array}
 \begin{array}{r}
 3.14159 \\
 120 \\
 \hline
 628318 \\
 314159 \\
 \hline
 37699080
 \end{array}$$

or .75 376.9908 times 1508 is the power necessary to [balance the weight.

$$\begin{array}{r}
 1508 \\
 .75 \\
 \hline
 7540 \\
 10556 \\
 \hline
 3769908) 11310000 (3 \text{ lbs. will balance the} \\
 11309724 \text{ weight, and is } \frac{2}{3} \text{ of} \\
 \hline
 276 \text{ the power expend-} \\
 \hline
 2)3 \text{ ed to move it.} \\
 1\frac{1}{2} \\
 3 \\
 \hline
 \text{Ans. } 4\frac{1}{2} \text{ lbs.}
 \end{array}$$

(6)

12  
4 ft.  
—  
48  
2  
—  
96 in. diam.

1 1/2  
or 3/2

3.14159  
96  
—  
1884954  
2827431  
—  
30159264  
30159264  
—  
30159264  
35  
—  
150796320  
90477792  
—  
10555.74240  
3  
—  
4)31667.2272  
—  
3)7916.8068 lbs.  
—  
2638.9356 — 1/3  
(Carried up.)

times 35

Dividing by 3/2

Will balance

5277.8712  
—  
5277.9 lbs. nearly.

THE WEDGE.

Lesson 201.

(1)  
10  
2  
—  
20  
2 1/2 or 10 times 50

(2)  
12  
2  
—  
24  
2 1/4 or 1/8 of 1800  
50  
10  
—  
Ans. 500 lbs.

(3)  
15  
2  
—  
30  
12 1/2 or 12 1/2 or 1 1/5 of 30  
15)30(2 in.  
30 [Ans.

Ans. 225 lbs.

PROMISCUOUS QUESTIONS  
IN  
MENSURATION, SQUARE ROOT, CUBE ROOT, &c.

Lesson 203.

(1)

$\begin{array}{r} 5 \\ 2 \\ \hline 4) 3.0 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ 5 \\ \hline 25 \\ 6\frac{2}{3} \\ \hline 150 \\ 8.33 \text{ \&c. } \frac{1}{3} \\ 8.33 \text{ \&c. } \frac{1}{3} \\ \hline 166.66 \text{ \&c. } \\ 55.55 \text{ \&c. } \\ 3.55 \text{ \&c. } \\ \hline 52 \\ 2700 \text{ oz. in a cubic ft.} \\ \hline 364 \\ 104 \\ \hline 16) 140400 \text{ (8,775 lbs. Ans.)} \\ 128 \\ \hline 124 \\ 112 \\ \hline 120 \\ 112 \\ \hline 80 \\ 80 \end{array}$	$\begin{array}{r} 2 \\ 2 \\ \hline 4 \\ 2\frac{2}{3} \\ \hline 8 \\ 1.33 \text{ \&c. } \frac{1}{3} \\ 1.33 \text{ \&c. } \frac{1}{3} \\ \hline 10.66 \text{ \&c. } \\ 3.55 \text{ \&c. } \end{array}$
<p>.75 ft. contraction in rising 1 ft.</p> <p>.75) 5.00 (<math>6\frac{2}{3}</math> ft. to come 450 [to a point.</p> <p><math>\frac{50}{5}</math> or <math>\frac{2}{3}</math></p> <p><math>6\frac{2}{3}</math> 4 — <math>2\frac{2}{3}</math> ft. height of small [pyramid.</p>		

(2)

$\begin{array}{r} 74088 \text{ (42 Ans.)} \\ 64 \\ \hline 4800) 10088 \\ 10088 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ 40 \\ \hline 1600 \\ 3 \\ \hline 4800 \\ 4800 \\ 2 \\ \hline 9600 \\ 480 \\ 8 \\ \hline 10088 \end{array}$	$\begin{array}{r} 40 \\ 3 \\ \hline 120 \\ 4 \\ \hline 480 \end{array}$	$\begin{array}{r} 2 \\ 2 \\ \hline 4 \\ 2 \\ \hline 8 \end{array}$
---	--	---	--



<p>(3)</p> $\begin{array}{r} 33 \\ 33 \\ 24 \\ 24 \quad 30 \\ \hline 114 \quad 19- \\ 19 \quad 11 \\ \hline 1026 \quad 24 \\ 114 \quad 44 \\ \hline 2166 \quad 22 \\ 264 \quad 264 \text{ both gable} \\ 9)2430 \quad \text{[ends.]} \\ \$ .25 \text{ or } \frac{1}{4} \quad 4)270 \\ \hline \text{Ans. } \$ 67\frac{1}{2} \end{array}$	<p>(4)</p> $\begin{array}{r} 35 \\ 20 \\ \hline 2)55 \\ \hline 27.5 \\ 18 \\ 16 \\ 24 \\ 10 \\ \hline 5)95.5 \\ \hline 19.1 \\ 250 \\ \hline 955 \\ 382 \\ \hline 4775.0 \end{array}$	<p>(5)</p> $\begin{array}{r} 28 \\ 22 \\ \hline 2)50 \\ \hline 25 \\ 23 \\ 19 \\ 18 \\ \hline 4)85 \\ \hline \text{Ans. } 21\frac{1}{4} \text{ cubic} \\ \text{[ft.]} \end{array}$
---	---	--

Ans. 4,775 sq. ft.

<p>(6)</p> <p>2500 square of one side.</p> $\begin{array}{r} 2 \\ \hline 5000 \quad ( \quad 70.71 \text{ ft.} \\ 49 \quad 12 \\ \hline 1407)10000 \quad 142 \\ 9849 \quad 71 \\ \hline 14141)15100 \quad 8.52 \\ 14141 \quad \text{or } 8\frac{1}{2} \text{ in. about.} \\ \hline 959 \end{array}$	<p>(7)</p> <p>ft. in.</p> $\begin{array}{r} 22 \quad 9 \\ \hline \text{ft.} \\ \text{or } 22.75 \\ 2 \quad 12 \\ \hline 45.50 \quad 2 \\ 24 \quad 24 \\ \hline 1820 \\ 910 \\ \hline 10920 \end{array}$
--	---

Ans. 1,092 ft.

<p>(8)</p> $\begin{array}{r} 3.14159 \\ 15 \\ \hline 1570795 \\ 314159 \\ \hline 2)15 \quad 47.12385 \\ 7.5 \quad 7.5 \\ \hline 23561925 \\ 32986695 \\ \hline 2)353.428875 \\ \hline 176.7144375 \end{array}$	<p>(9)</p> $\begin{array}{r} 3.14159 \\ 4 \\ \hline 12.56636 \\ 2 \\ \hline 2)25.13272 \\ \hline 12.56636 \\ 27 \\ \hline 8796452 \\ 2513272 \\ \hline 339.29172 \end{array}$	<p>(10)</p> $\begin{array}{r} 3.14159 \\ 6 \\ \hline 18.84954 \\ 6 \\ \hline 113.09724 \\ \hline \text{Ans. } 113\frac{1}{10} \text{ sq. in.} \\ \text{[nearly.]} \end{array}$
--	---	--

Ans. 176.714 sq. ft. about. Ans. 339.29 cubic ft. about.

**Lesson 204.**

(1)

$$\begin{array}{r} 11350 \overline{) 90800} \quad (8 \text{ (2 ft. square.} \\ 90800 \quad 8 \end{array}$$

(2)

$$\begin{array}{r} 22 \\ 17 \\ \hline 5 \\ 3 \\ \hline 5 \overline{) 15} \\ 3 \\ \hline 17 \\ 20 \\ \hline 3.14 \\ 20 \\ \hline 62.80 \\ 10 \\ \hline 2 \overline{) 628.0} \\ 314 \\ 26 \\ \hline 1884 \\ 628 \\ \hline 282 \overline{) 8164} \quad (29 \text{ gals. nearly, Ans.} \\ 564 \\ \hline 2524 \\ 2538 \end{array}$$

(3)

$$\begin{array}{r} 60 \\ 20 \\ \hline 1200 \\ 9\frac{1}{2} \\ \hline 10800 \\ 600 - \frac{1}{2} \\ \hline 95 \overline{) 11400} \quad (120 \text{ tons, Ans.} \\ 95 \\ \hline 190 \\ 190 \\ \hline 0 \end{array}$$

(4)

The short part is  $\frac{1}{3}$  or  $\frac{1}{3}$  of the long part.

Both parts then are  $\frac{1}{3}$  and  $\frac{1}{3}$ , or  $\frac{2}{3}$  of the long part.

$$6 \overline{) 10} \quad (1 \text{ ft.}$$

6

—

4

12

—

$$) 48 \quad (8 \text{ in.}$$

48

(5)

$\frac{250}{2000}$ , or  $\frac{1}{8}$  of 15000 lbs. will *balance* it, and is  $\frac{3}{4}$  of the  
[power expended since  $\frac{1}{8}$  is lost.

$$\begin{array}{r} 8)15000 \\ 2)1875 \\ \hline 937\frac{1}{2} - \frac{1}{8} \end{array}$$

A power capa- 937 $\frac{1}{2}$   
ble of raising 1875  
2,812 $\frac{1}{2}$  lbs. Ans.

(6)

$\frac{3}{4}$  of 1  
or 1 $\frac{1}{2}$  in. Ans.

(7)

in. ft.  
9 7 $\frac{1}{2}$   
or .75 ft. or 7.5 ft.

7 $\frac{1}{2}$  times 100

7.5  
100

.75)750.00(1000 lbs. Ans.

75  
—  
000

(8)

By drawing a figure we see that the  
weight is here supported by 4 ropes.

$$\begin{array}{r} 96 \\ 4 \\ \hline 4)384 \\ \hline 96 \\ 384 \\ 96 \\ \hline \end{array}$$

Ans. 288 lbs.

(9)

$$\begin{array}{r} 12 \\ 6 \\ \hline 72 \\ 2 \\ \hline 144 \text{ diam.} \end{array} \quad \begin{array}{r} 3.14159 \\ 144 \end{array}$$

$$\begin{array}{r} 1256636 \\ 1256636 \\ 314159 \\ \hline 45238896 \end{array}$$

$$\begin{array}{r} \frac{1}{2} \\ 45238896 \text{ times } 679 \\ 2)679 \end{array}$$

45238896)339.500000(.75 lb. or  $\frac{3}{4}$  of a lb. about,  
316672272 [Ans.

$$\begin{array}{r} 228277280 \\ 226194480 \\ \hline 2082800 \end{array}$$

(10)

Dividing  $\frac{3}{4}$  by 2 we get  $\frac{3}{8}$

$\frac{3}{4}$  and  $\frac{3}{8}$  are  $\frac{3}{8}$  or 1 $\frac{1}{8}$  lb.  
[about, Ans.

PROGRESSION BY DIFFERENCE.

Lesson 205.

$$\begin{array}{r} (3) \\ 40 \\ 1 \\ \hline 39 \\ 6 \\ \hline 234 \quad 266 \\ 234 \quad 234 \\ \hline \text{Ans. } 32 \end{array}$$

$$\begin{array}{r} (4) \\ 501 \\ 1 \\ \hline 500 \\ 50 \\ \hline 25000 \\ 50 \\ \hline \text{Ans. } 25,050 \end{array}$$

$$\begin{array}{r} (5) \\ 34 \\ 1 \\ \hline 333 \\ 11 \\ 12 \\ \hline \text{Ans. } 23 \text{ cts.} \end{array}$$

Lesson 206.

$$\begin{array}{r} (2) \\ 100 \\ 8 \\ \hline 4)92 \\ 23 \\ 1 \\ \hline \text{Ans. } 24 \end{array}$$

$$\begin{array}{r} (3) \\ 336 \\ 16 \\ \hline 32)320(10 \\ 32 \quad 1 \\ \hline 0 \quad 11 \text{ Ans.} \end{array}$$

$$\begin{array}{r} (4) \\ \text{cts.} \\ 6\frac{1}{2} \\ \text{or } \$ .0625 \\ .0625)13.00 \\ \underline{.50} \\ 12.5000(200 \\ \underline{12.50} \quad \text{[Ans.]} \\ 00 \end{array}$$

$$\begin{array}{r} (6) \\ 24 \quad 122 \\ 1 \quad 7 \\ \hline 23 \quad 23)115(5 \text{ Ans.} \\ 115 \end{array}$$

$$\begin{array}{r} (7) \\ 29 \quad 2000 \\ 1 \quad 180 \$ \\ \hline 28 \quad 28)1820(65 \\ 168 \quad \text{[Ans.]} \\ \hline 140 \\ 140 \end{array}$$

$$\begin{array}{r} (8) \\ 5 \quad 239 \\ 1 \quad 135 \\ \hline 4 \quad 4)104 \\ \hline 26 \text{ lbs.} \\ \text{[Ans.]} \end{array}$$

Lesson 207.

$$\begin{array}{r} (2) \\ 5 \\ 595 \\ \hline 2)600 \\ 300 \\ 60 \\ \hline 18,000 \text{ Ans.} \end{array}$$

$$\begin{array}{r} (3) \\ 16 \\ 464 \\ \hline 2)480 \\ 240 \\ 14 \\ \hline 96 \\ 24 \\ \hline 3,360 \text{ ft. Ans.} \end{array}$$

(4)

$$\begin{array}{r}
 7 \\
 3 \\
 \hline
 \text{Common diff. } 4
 \end{array}
 \quad
 \begin{array}{r}
 43 \\
 3 \\
 \hline
 4) \overline{40} \\
 \underline{10} \\
 1 \\
 \hline
 11 \text{ rows.}
 \end{array}$$

3 first term.  
43 last term.

(5)

$$\begin{array}{r}
 2) \overline{46} \\
 \underline{23} \\
 11 \\
 \underline{23} \\
 23 \\
 \hline
 253 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 5 \\
 35 \\
 2) \overline{40} \\
 \underline{20} 220 \\
 \hline
 \text{Ans. } 11
 \end{array}$$

(6)  
9)1296

144 average of first  
and last terms.

2  
288 sum of first and  
last terms.

Ans. 16 ft.

(7)

$$\begin{array}{r}
 25 \\
 9 \quad 1 \\
 7 \quad \underline{\quad} \\
 \underline{\quad} 24 \\
 \text{Common} \quad 2 \quad 2 \\
 \text{diff.} \quad \underline{\quad} \\
 48 \\
 7 \\
 \hline
 55 \text{ men in} \\
 \text{last rank.}
 \end{array}$$

(8)

$$\begin{array}{r}
 8 \quad 36 \\
 4 \quad 4. \quad 4 \\
 \hline
 \text{Common} \quad 4 \quad 4) \overline{32} \quad 4 \\
 \text{diff.} \quad \underline{\quad} \quad \underline{\quad} \quad 36 \\
 \quad \quad \underline{8} \quad 2) \overline{40} \\
 \quad \quad 1 \quad \underline{\quad} \\
 \quad \quad 9 \text{ ranks.} \quad 20 \\
 \quad \quad \underline{\quad} \quad 9 \\
 \text{Ans. } 180
 \end{array}$$

$$\begin{array}{r}
 55 \\
 7 \\
 \hline
 2) \overline{62} \\
 \underline{31} \\
 25 \\
 \hline
 155 \\
 62 \\
 \hline
 \text{Ans. } 775
 \end{array}$$

(9)

$$\begin{array}{r}
 30 \\
 1 \\
 \hline
 29 \\
 3 \\
 \hline
 87 \quad 99 \\
 87 \quad 87 \\
 \hline
 12 \text{ first} \\
 \text{[term.]} \\
 12 \\
 99 \\
 \hline
 2) \overline{111} \\
 \underline{\quad} \\
 55.5 \\
 30 \\
 \hline
 1665.0 \\
 \text{Ans. } 1,665
 \end{array}$$

# PROGRESSION BY QUOTIENT.

## Lesson 208.

<p>(3)</p> $  \begin{array}{r}  4 \\  4 \\  \hline  16 \\  4 \\  \hline  64 \\  4 \\  \hline  256 \\  4 \\  \hline  1024 \\  4 \text{ first term.} \\  \hline  \text{Ans. } 4,096  \end{array}  $	<p>(5)</p> $  \begin{array}{r}  1828 \\  1600 \\  \hline  12 \overline{)228} \text{ (19; there are then 20 terms.} \\  \underline{12} \\  108 \\  \underline{108} \\  0  \end{array}  $	$  \begin{array}{r}  2 \\  2 \\  4 \\  2 \\  8 \\  2 \\  16 \\  2 \\  32 \\  2 \\  64 \\  2 \\  128 \\  2 \\  256 \\  2 \\  512 \\  2 \\  1024 \\  2 \\  2048 \\  2 \\  4096 \\  2 \\  8192 \\  2 \\  16384 \\  2 \\  32768 \\  2 \\  65536 \\  2 \\  131072 \\  2 \\  262144 \\  2 \\  \text{Ans. } \$ 524,288  \end{array}  $
<p>(4)</p> <p>7 terms.</p> $  \begin{array}{r}  2 \\  2 \\  \hline  4 \\  2 \\  \hline  8 \\  2 \\  \hline  16 \\  2 \\  \hline  32 \\  2 \\  \hline  64 \\  10000000 \\  \hline  \text{Ans. } 64,000,000  \end{array}  $		

## Lesson 209.

(3)		(4)	
1825		10	
1325		10	
25) 500 (20; there are then 21		100	
50	[terms.	10	
0		1000	
2		10	
2		10000	
4		10	
2		100000	
8		10	
2		1000000	
16		10	
2		10000000	
32		10	
2		100000000	
64		10	
2		1000000000	
128		10	
2		10000000000 last term.	
256		1	
2		9) 9999999999	
512		1111111111	
2		10000000000	
1024		Ans. \$ 111,111,111.11	
2			
2048			
2			
4096		(5)	
2		$\frac{5}{2}$ , or $\frac{3}{2}$ , ratio.	$45\frac{1}{2}$
8192	(Brought up.)	Difference between	4
2	262144	1, or $\frac{3}{2}$ , and $\frac{3}{2}$ is $\frac{1}{2}$	$41\frac{1}{2}$
16384	524288		2
2	2		
32768	1048576		$83\frac{1}{2}$
2	2 first term.		$45\frac{1}{2}$
65536	2097152 last term.		
2	2		Ans. 128 $\frac{1}{2}$
131072	2097150		
2	2097152		
262144	4,194,302 Ans.		
(Carried up.)			

**Lesson 210.**

(1)

$\frac{1}{2}$ , ratio.

Difference between 2  
1 and  $\frac{1}{2}$  is  $\frac{3}{2}$

Ans. 4

(2)

$\frac{1}{3}$ , ratio.

Difference between 1  
1 and  $\frac{1}{3}$  is  $\frac{2}{3}$

2)  $\frac{3}{2}$   
Ans.  $1\frac{1}{2}$

(3)

$\frac{1}{10}$ , ratio.

Difference between  
1 and  $\frac{1}{10}$  is  $\frac{9}{10}$

$\frac{9}{10}$  is in  $\frac{1}{10}$ ,  $\frac{10}{90}$  or  $\frac{1}{9}$   
[Ans.]

(4)

.3).03

.1 or  $\frac{1}{10}$  ratio.

Difference between  
1 and  $\frac{1}{10}$  is  $\frac{9}{10}$

$\frac{9}{10}$  is in .3,  $\frac{3}{9}$  or  $\frac{1}{3}$   
[Ans.]

(5)

.139).000139 (.001 or  $\frac{1}{1000}$ , ratio.  
139

Difference between  
1 and  $\frac{1}{1000}$  is  $\frac{999}{1000}$

.139  
Dividing by  $\frac{999}{1000}$ , 1000  
139.000  
Ans.  $\frac{139}{999}$

(6)

10 terms.

10  
10  
100  
10  
1000  
10  
10000  
10  
100000  
10  
1000000  
10  
10000000  
10  
100000000  
10  
1000000000  
5

8|000) 5000000000

2) 625000

8) 312500

4) 390625 — 2.5 or  $2\frac{1}{2}$  pks.  
9,765 bu.

D D

(7)

$\frac{3}{8}$  or  $\frac{1}{2}$ , ratio.

Difference between 384  
1 and  $\frac{1}{2}$  is  $\frac{1}{2}$

384  
3  
381  
2  
762  
3  
Ans. 765



## PROGRESSION BY QUOTIENT

APPLIED TO

COMPOUND INTEREST.

## Lesson 211.

$$\begin{array}{r}
 (1) \\
 2012196 \\
 \underline{80} \\
 160975680 \\
 \text{Ans. \$ } 160.98
 \end{array}$$

$$\begin{array}{r}
 (3) \\
 1790848 \\
 \underline{1000} \\
 1790848000 \\
 \underline{1000} \\
 790848 \\
 \text{Ans. \$ } 790.85
 \end{array}$$

$$\begin{array}{r}
 (4) \\
 1551328 \\
 \underline{100} \\
 155.132800 \\
 \text{Ans. \$ } 155.13
 \end{array}$$

$$\begin{array}{r}
 (6) \quad \$ \\
 1790848) 3581700000 (2000 \text{ Ans.} \\
 \underline{3581696} \\
 4000
 \end{array}$$

$$\begin{array}{r}
 (7) \quad \$ \\
 1593848) 143450000 (90.00 \text{ Ans.} \\
 \underline{14344652} \\
 348000
 \end{array}$$

$$\begin{array}{r}
 (2) \\
 6525125 \\
 \underline{1718186} \\
 39150750 \\
 52201000 \\
 6525125 \\
 52201000 \\
 6525125 \\
 45675875 \\
 6525125 \\
 \underline{11211378423250} \\
 \text{Ans. \$ } 11,211.38
 \end{array}$$

$$\begin{array}{r}
 (5) \\
 5|0) 8|447 \\
 \underline{16894}
 \end{array}$$

Ans. 9 years, as found  
by the Table.

(8)

1.500730) 500.000000 (333.17 Ans.  
4502190

4978100  
4502190

4759100  
4502190

(9)

1.10  
1.10

2569100  
1500730

11  
11

10683700  
10505110

1.21  
1.10

178590

121  
121

1.331  
1.10

1331  
1331

1.4641  
1.10

1.4641  
1.4641

1.61051) 1000.000000 (620.92      1000  
966306      620.92

Ans. \$379.08

336940  
322102

1483800  
1449459

343410  
322102

21308

## ANNUITIES.

## Lesson 212.

(2)		(3)	
240		425	
.06		.07	
<hr/>		<hr/>	
1440		29.75	
29 yrs.		9 yrs.	
<hr/>		<hr/>	
1296		267.75	
288		425	
<hr/>		<hr/>	
417.6		\$692.75	amount of 1st
240			[instalment.
<hr/>		<hr/>	
\$657.6	amount of 1st	692.75	
	[instalment.	425	
<hr/>		<hr/>	
657.6		2) 1117.75	
240.		<hr/>	
<hr/>		<hr/>	
2) 897.6		558.875	
<hr/>		10 yrs.	
448.8		<hr/>	
30 yrs.		5588.750	
<hr/>		<hr/>	
134640		Ans. \$5,588.75	
Ans. \$13,464			
(4)			
20			
.06			
<hr/>			
12) 1.20	(.10 .10 35 mo.		
12			
<hr/>			
0	3.50		
	20		
<hr/>			
	23.50	amount of 1st	
		[instalment.	
	23.50		
	20		
<hr/>			
2) 43.50			
<hr/>			
21.75			
(Carried up.)			
		(Brought up.)	
		21.75	
		36 mo.	
		<hr/>	
		13050	
		6525	
		<hr/>	
		78300	
		<hr/>	
		Ans. \$783	

(6)

1.24) 800.00 (645.161  
744

560  
496

640  
620

200  
124

760  
744

160  
124

36

1.18) 800.00 (677.966  
708

920  
826

940  
826

1140  
1062

780  
708

720  
708

12

1.12) 800.00 (714.285  
784

160  
112

480  
448

320  
224

960  
896

640  
560

80

1.06) 800.00 (754.717  
742

580  
530

500  
424

760  
742

180  
106

740  
742

645.161  
677.966  
714.285  
754.717

2792.129

Ans. \$2,792.13

.(7)

1.50) 300.00 (133.383 &amp;c.

150

500

450

500

1.40) 200.00 (142.857

140

600

560

400

280

1200

1120

800

700

1000

980

20

1.30) 200.00 (153.846

130

700

650

500

390

1100

1040

600

520

800

780

20

1.20) 200.00 (166.666 &amp;c.

120

800

720

800

1.10) 200.00 (181.818 &amp;c.

110

900

880

200

110

900

133.333

142.857

153.846

166.666

181.818

778.520

Ans. \$778.52

**Lesson 213.**

	(2)	(3)
	1.593848	4).07
	250	<u>.0175</u>
	<u>7969240</u>	1.0175 ratio. 1.0175
	3187696	<u>1.0175</u>
1.06	<u>398.462000</u>	50875
1	250	71225
		<u>10175</u>
.06	.06) 148.462	10175
	<u>24743666 &amp;c.</u>	<u>1.03530625</u>
	250	1.0175
	<u>27243666 &amp;c.</u>	517653125
Ans. \$2,724.37		724714375
		103530625
		<u>103530625</u>
		1.053424109375
		<u>1.0175</u>
		52671205
		73739687
		10534241
		<u>10534241</u>
		1.07185902175
		<u>1.0175</u>
		5359295
		7503013
		1071859
		<u>1071859</u>
		1.0906165325
		<u>1.0175</u>
		54530826625
		76343157275
		10906165325
		<u>10906165325</u>
		1.10970232181875
		(Carried over.)

(Brought over.)

1.10970232181875  
 1.0175

5548510  
 7767914  
 1109702  
 1109702

1.1291217850 — 1st.  
 100

1129121785000

1129121785  
 100

(4)  
 1215506  
 333

3646518  
 3646518  
 3646518

404.763498  
 333

.05) 71.763498

1435.26996  
 333

1768.26996

Ans. \$1768.27

.0175) 129121785 (737.838  
 1225 112912

662 \$850.750 Ans.  
 525

1371  
 1225

1467  
 1400

678  
 525

1535  
 1400

135

(6)

1.06) 240.00 (226.4151  
 212

280

212

680

636

440

424

160

106

540

530

100

106

1.689479) 240.000000 (142.0556  
 1689479

7105210

6757916

3472940

3378958

9398200

8447395

.06) 84.3595

1405.991

226.415

1632.406

\$1,632.41 Ans.

9508050

8447395

10606550

10136874

(7)  
The present worth of the last instalment  
is nothing. .07

$$\begin{array}{r}
 1.07) 180.00 (168.2243 \\
 \underline{107} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 730 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \underline{642} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 880 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \underline{856} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 240 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \underline{214} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 260 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \underline{214} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 460 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \underline{428} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 320 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \underline{321} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \\
 \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00} \phantom{00}
 \end{array}$$

\$2,571.43 Ans.

(8)  
1.500730) 5000.000000 (333.1712  
4502190

$$\begin{array}{r}
 4978100 \\
 \underline{4502190} \\
 4759100 \\
 \underline{4502190} \\
 2569100 \\
 \underline{1500730} \\
 10683700 \\
 \underline{10505110} \\
 1785900 \\
 \underline{1500730} \\
 2851700 \\
 \underline{3001460}
 \end{array}$$

2.104852) 5000.000000 (237.5464  
4209704

$$\begin{array}{r}
 7902960 \\
 \underline{6314556} \\
 15884040 \\
 \underline{14733964} \\
 11500760 \\
 \underline{10524260} \\
 9765000 \\
 \underline{8419408} \\
 13455920 \\
 \underline{12629112}
 \end{array}$$

$$\begin{array}{r}
 8268080 \\
 \underline{8419408}
 \end{array}$$

$$\begin{array}{r}
 333.1712 \\
 237.5464 \\
 \underline{.07} 95.6248 \\
 1366.0685 \\
 \underline{333.1712} \\
 1699.2397
 \end{array}$$

Ans. \$1,699.24



## ANNUITIES.

(9)

**1.06)1.000(.943396    1.191016)1.0000000(.839619**  
**954                      9528128**

954

**9528128**

460

4718720

424

**3573048**

360

**1 1 4 5 6 7 2 0**

318

10719144

420

**7375760**

318

**7146096**

1020

2296640

954

1191016

660

11056240

636

10719144

24

**337096**

**.943396**

**.839619**

**.06) .103777**

**1.729616**

**.943396**

**2.673012) 8000.000000 (1122.329**

**2673012**

**§ 1,122.33 Ans.**

**3269880**

**2673012**

**5968680**

5346024

**6 2 2 6 5 6 0**

**5346024**

**8805360**

8019036

7863240

**5346024**

**25172160**

**24057108**

**1115052**

PROMISCUOUS QUESTIONS  
IN  
PROGRESSION BY DIFFERENCE, &c.

Lesson 214.

$$\begin{array}{r}
 \text{(1)} \\
 1310796 \\
 \underline{\phantom{000}200} \\
 262159200 \\
 \underline{\phantom{000}200} \\
 .07)62.1592 \\
 \underline{\phantom{000}887.9885} \\
 262.1592 \\
 \underline{\phantom{000}1150.1477} \\
 \$1,150.15 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 \text{(2)} \\
 12 \\
 16 \\
 \underline{\phantom{00}72} \\
 12 \\
 \underline{\phantom{00}192 \text{ oz.}} \\
 4 \\
 \underline{\phantom{00}2)188} \\
 94 \\
 \underline{\phantom{00}1}
 \end{array}$$

$$\begin{array}{r}
 \text{(3)} \\
 14 \\
 4 \\
 \underline{\phantom{00}5)10} \\
 \text{Ans. } 2 \text{ miles.}
 \end{array}$$

Ans. ; in the 95th

$$\begin{array}{r}
 \text{(4)} \\
 4 \\
 14 \\
 \underline{\phantom{00}2)18} \\
 9 \\
 6 \\
 \underline{\phantom{00}54 \text{ miles.}}
 \end{array}$$

$$\begin{array}{r}
 \text{(5)} \quad .05 \\
 1.05)300.00 \quad (285.71428 \\
 \underline{\phantom{000}210} \\
 900 \quad 5714.2856 \\
 \underline{\phantom{000}840} \quad 285.71428 \\
 600 \quad 5999.99988 \\
 \underline{\phantom{000}525} \quad \$6,000 \text{ Ans.} \\
 750 \\
 \underline{\phantom{000}735} \\
 150 \\
 \underline{\phantom{000}105} \\
 450 \\
 \underline{\phantom{000}420} \\
 300 \\
 \underline{\phantom{000}210} \\
 900 \\
 \underline{\phantom{000}840} \\
 60
 \end{array}$$

$$\begin{array}{r}
 \text{(6)} \quad \text{(7)} \\
 4 \quad 12 \\
 4 \quad 1 \\
 \underline{\phantom{00}16} \\
 4 \quad 11 \\
 \underline{\phantom{00}64} \quad 3 \\
 4 \quad 33 \\
 \underline{\phantom{00}256} \quad 7 \\
 4 \quad \text{Ans. } 40 \\
 \underline{\phantom{00}1024} \\
 4 \\
 \underline{\phantom{00}4096} \\
 4 \\
 \underline{\phantom{00}16384} \\
 4 \\
 \underline{\phantom{00}65536} \\
 3 \\
 \underline{\phantom{00}196608} \text{ last term.} \\
 3 \text{ first term.} \\
 \underline{\phantom{00}3)196605} \\
 65535 \\
 \underline{\phantom{00}196605} \\
 \text{Ans. } 262,140
 \end{array}$$

$$1.06) 500.00 (471.698$$

$$\begin{array}{r} 424 \\ \hline 760 \\ 742 \\ \hline 180 \\ 106 \\ \hline 740 \\ 636 \\ \hline 1040 \\ 954 \\ \hline 860 \\ 848 \\ \hline 12 \end{array}$$

(8)

$$1.12) 500.00 (446.428$$

$$\begin{array}{r} 448 \\ \hline 520 \\ 448 \\ \hline 720 \\ 672 \\ \hline 480 \\ 448 \\ \hline 320 \\ 224 \\ \hline 960 \\ 896 \\ \hline 64 \end{array}$$

$$\begin{array}{r} 471.698 \\ 446.428 \\ \hline 918.126 \end{array}$$

Ans. \$918.13

(9)

$$1.1236$$

$$700$$

$$\begin{array}{r} 786.5200 \\ 700 \\ \hline \end{array}$$

$$.06) 86.52$$

$$\begin{array}{r} 1442 \\ 786.52 \\ \hline \end{array}$$

Ans. \$2,228.52

(10)

$$3$$

$$3$$

$$9$$

$$3$$

$$27$$

$$3$$

$$81$$

$$3$$

$$243$$

$$3$$

$$729$$

$$2$$

$$3000$$

$$64 \quad 64) 2187000 (34171.875$$

$$192$$

$$\$34,171.87\frac{1}{2}$$

$$267$$

[Ans.

$$256$$

$$110$$

$$64$$

$$460$$

$$448$$

$$120$$

$$64$$

$$560$$

$$512$$

$$480$$

$$448$$

$$320$$

$$320$$

# EXCHANGE.

## Lesson 218.

(1)				(2)				(3)			
				£	s.	d.	qrs.				
				25	12	8	2				
4) 87.25				4) 2.0				1000			
				12) 8.5				40			
£ 218125				20) 12.70833 &c.				9) 40000			
20				25.6354166 &c.				4444.444 &c.			
16.2500 s.				40				\$ 4,444.44			
12				9) 1025.4166666 &c.				[Ans.]			
50				113.93518							
25				\$ 113.94 Ans.							
3.00 d.											
(4)				(5)				(6)			
				£	s.	d.		£	s.	d.	
817.15				101	4	6		78	11	8	
9				98	15	6		12) 8.0			
40) 7354.35				250	8	3		20) 11.666 &c.			
				49	11	9		78.5833 &c.			
£ 18385875				500 0 0				4			
20				40				314.3333 &c.			
17.17500 s.				9) 20000				\$ 314.33½			
12				2222.222 &c.				[Ans.]			
350				Ans. \$ 2,222.22							
175											
2.100											
or 2½ d.											
(7)				(8)							
1100				637.50							
10				3							
3) 11000				10) 1912.5							
3666.666 &c.				£ 191.25							
Ans. \$ 3,666.67				20							
				5.00 s.							

## Lesson 219.

(1)		(2)	(3)
£	s.		£ s. d.
750	18	667.37	156 8 9
		7	
2 0) 1 8.0		3 0) 467 1.59	12) 9.0
750.9		£ 155.71966 &c.	2 0)  8.75
30		20	156.4375
7) 22527.0		1439333 s.	10
		12	
3218.142		78666	4) 1564.3750
Ans. \$3,218.14		39333	391.09375
		4.71996 d.	Ans. \$391.09
		4	or
		2.87984 qrs.	£ s. d.
			156 8 9
			2½
			312
			78 —½
			8 s. is - 1
			9 d. is - .09
			Ans. \$391.09
(4)	\$	(5)	
2.5) 800.0 (320 Ans.		9000	
75		8	
50		3) 72000	
50			
0		Ans. \$24,000	
(6)		(7)	
1700		200	
3		10	
8) 5100		3) 2000	
£637.5		\$666⅔	
20		9	
10.0 s.		5994	
		3 — ⅓	
		3 — ⅓	
		4 0) 600 0	
		Ans. £150	

(8)		(9)
5 0 0		£   s.   d.
9		1 5   5   4
40) 45 0 0		5
£ 1 1 2 5	1 1 2   1 0	7 6   6   8
20	1 0 0   5   4	12) 8.0
10.0 s.	12   4   8 Ans.	20) 6.6 6 6 &c.
		7 6 3 3 3 3 &c.
		40
		9) 3 0 5 3 3 3 3
		3 3 0 2 5 9 2
		Ans. \$ 3 3 9 2 6

Lesson 220.

(1)		(2)
cts.		4.3 2
25		.05
or \$ $\frac{1}{4}$	4) 12 0 0 0	.2 1 6 0
	1.0 7) 3 0 0 0.0 0 (2803.738	4.3 2
	2 1 4   \$ 2,803.74	4.5 3 6) 6 8 9 7.7 5 0 (1520.668
	[Ans. 4.5 3 6)	4 5 3 6   1,520.668
	8 6 0	2 3 6 1 7
	8 5 6	2 2 6 8 0
	4 0 0	9 3 7 5
	3 2 1	9 0 7 2
	7 9 0	3 0 3 0 0
	7 4 9	2 7 2 1 6
	4 1 0	3 0 8 4 0
	3 2 1	2 7 2 1 6
	8 9 0	3 6 2 4 0
	8 5 6	3 6 2 8 8
	3 4	

<p>(3)</p> <p>8)30000</p> <hr/> <p>16)3750(234 and 6 dol- 32 [ars, Ans.</p> <hr/> <p>55</p> <hr/> <p>48</p> <hr/> <p>70</p> <hr/> <p>64</p> <hr/> <p>6 dollars.</p>	<p>(4)</p> <p>.186</p> <hr/> <p>7000</p> <hr/> <p>1.02)1302.000(1276.47</p> <hr/> <p>102 Ans. \$1,276.<sup>47</sup>/<sub>100</sub></p> <hr/> <p>282</p> <hr/> <p>204</p> <hr/> <p>780</p> <hr/> <p>714</p> <hr/> <p>660</p> <hr/> <p>612</p> <hr/> <p>480</p> <hr/> <p>408</p> <hr/> <p>720</p> <hr/> <p>714</p>
<p>(5)</p> <p>485</p> <hr/> <p>.01</p> <hr/> <p>.0485</p> <hr/> <p>485</p> <hr/> <p>4.8985)10000.0000(2041.44</p> <hr/> <p>97970 2,041.<sup>44</sup>/<sub>100</sub></p> <hr/> <p>[Ans.</p> <hr/> <p>203000</p> <hr/> <p>195940</p> <hr/> <p>70600</p> <hr/> <p>48985</p> <hr/> <p>216150</p> <hr/> <p>195940</p> <hr/> <p>202100</p> <hr/> <p>195940</p> <hr/> <p>6160</p>	<p>(6)</p> <p>cts.</p> <p>33 <sup>1</sup>/<sub>3</sub></p> <hr/> <p>or \$ <sup>1</sup>/<sub>3</sub> 3)15000</p> <hr/> <p>Ans. 5,000</p>
<p>(8)</p> <p>1.48</p> <hr/> <p>800</p> <hr/> <p>1184.00</p> <hr/> <p>Ans. \$1,184</p>	<p>(7)</p> <p>24000</p> <hr/> <p>.40</p> <hr/> <p>4)9600.00</p> <hr/> <p>2400</p> <hr/> <p>403</p> <hr/> <p>72</p> <hr/> <p>96</p> <hr/> <p>9672.00</p> <hr/> <p>Ans. \$9,672.00</p>

(9)  
scudi. tari.  
85 9

12) 90 (.75 85.75  
84 .95

60 42875  
60 77175

814625

Ans. \$8146

(10)

3600  
.11  $\frac{1}{2}$

36  
36

396.00  
4.00 —  $\frac{1}{2}$

400.00

Ans. 400

Lesson 221.

(1)

432  
.04

.1728  
4.32

4.4928

2300  
.46

138  
92

4.4928) 1058.0000 (235 half joes.  
89856

159440  
134784

246560  
224640

\$2.1920

(2)

16  
.04

43264  
.16

.64  
16

259584  
43264

16.64 16.64) 6922.24 (416 Ans.  
6656

2662  
1664

9984  
9984

FF

(3)

£ s. d.  
645 6 8

6  $\frac{8}{12}$  s.  
or 6  $\frac{2}{3}$  s.

20) 6  $\frac{2}{3}$

£ s. d.  
645  $\frac{1}{3}$  3  $\frac{20}{60}$  or  $\frac{1}{3}$

1935

1 —  $\frac{1}{3}$

Ans. 1,936



## EXCHANGE.

(4)

$$\begin{array}{r} 320 \\ 600 \\ \hline 1920.00 \\ 925.37\frac{1}{2} \\ \hline \text{Ans. } \$994.62\frac{1}{2} \end{array}$$

(5)

£	s.	d.
964	8	4
	8 $\frac{1}{2}$ s.	
	or 8 $\frac{1}{2}$ s.	
	20) 8 $\frac{1}{2}$	
	$\frac{2}{3}$	60) 2 $\frac{1}{5}$
964.4166 &c.		.4166 &c.
2 $\frac{2}{3}$		

$$\begin{array}{r} 1928.8333 \text{ &c.} \\ 107.1574 - \frac{1}{8} \\ 107.1574 - \frac{1}{8} \\ \hline 2143.1481 \\ \text{Ans. } \$2,143.15 \end{array}$$

(6)

$$\begin{array}{r} 1000 \\ .01 \\ \hline 1000 \\ 4284 \\ 1000 \\ \hline 4280.000 \\ 5.714 \\ \hline 4285.714 \\ \text{\$4,285.71 Ans.} \end{array}$$

(7)

fl.	kreuz.
108	36 or $\frac{36}{100}$ or $\frac{6}{10}$ or $\frac{3}{5}$ fl.
.48	
864	.48
432	3
51.84	5) 1.44
.288	.288
52.128	
Ans. \\$52.13	

(8)

$$\begin{array}{r} 8736.45 \\ .64 \\ \hline 3494580 \\ 5241870 \\ \hline 55913280 \\ \text{Ans. } \$5,591.33 \end{array}$$

(9)

marks banco.	skillings.
1988	15
1988.9375	16) 15.0 (.9375)
.34	144
79557500	60
59668125	48
676238750	120
Ans. \\$676.24	112
	80
	80

## Lesson 222.

(1)			(2)		
dollars.	reals.	mar.			
1967	7	15		10400	
				.186	
	reals.				
8)	7.44	34)	15.0 (.44		624
			136		832
					104
1967.93					
.68			140		
			136		1934400
1574344					187637
1180758			4		
1338.1924					
\$ 1338.19	Ans.				

1876.37) 58.0300 (.03 or 3 per cent. about above par, Ans.

562911

17389

1876.37) 58.0300 (.03 or 3 per cent. about above par, Ans.

562911

17389

**Ans. \$917.88**

$$\begin{array}{r}
 \textcircled{6} \\
 8232 \\
 .04 \\
 \hline
 329.28 \\
 8232 \\
 .75) \overline{8561.28} \quad (11415.04 \\
 \underline{75} \quad \text{Ans. } 11,415 \text{ rubles } 4 \text{ ko-} \\
 106 \quad \text{[pecs.]} \\
 \underline{75} \\
 311 \\
 \underline{300} \\
 112 \\
 \underline{75} \\
 378 \\
 \underline{375} \\
 300 \\
 \underline{300}
 \end{array}$$

$$\begin{array}{r} \text{(7)} \\ 2000 \\ .02 \\ \hline 40.00 \\ 2000 \\ \hline \text{Ans. } \$2,040 \end{array}$$

## Lesson 223.

$$\begin{array}{r}
 \text{s.} \quad \text{d.} \quad \text{£} \\
 4 \quad 2 \quad 1 \\
 \underline{12} \quad \quad \quad 20 \\
 48 \quad \quad \quad 20 \\
 \underline{2} \quad \quad \quad 12 \\
 50 \text{ d.} \quad \quad 240 \text{ d.} \\
 \\
 50 \quad \quad \quad 240 \\
 \underline{12} \quad \quad \quad 1 \\
 10 \quad \quad \quad 240 \\
 \underline{5} \quad \quad \quad 8000 \\
 600 \quad 6|00) \quad 19200|00 \\
 \text{Ans. } \$3200
 \end{array}$$

$$\begin{array}{r}
 \textbf{(3)} \\
 .35 \\
 \underline{9000} \\
 315 \text{ } 0.00 \\
 \underline{.04} \\
 12600 \\
 3150 \\
 \underline{3276} \\
 2700 \\
 \textbf{Ans. } \$576 \text{ gain.}
 \end{array}$$

(2)		
s.	d.	£
4	2	1
12		20
<hr/>		<hr/>
48		20
2		12
<hr/>		<hr/>
50 d.		240 d.
		240
		1
		<hr/>
50		240
24		2
<hr/>		<hr/>
20		480
10		3
<hr/>		<hr/>
1200		1440
4		9000
<hr/>		<hr/>
4800	4800	12960000
		9600
		<hr/>
		33600
		33600
		<hr/>
		00

(4)

By analysis.

£	s.	d.
1	4	2
20	12	
20	48	
12	2	
240 d.	50 d.	

50 d. value of 1 rix dollar. . 5.25 fr. value of 1 rix dollar.

 $\frac{2\frac{1}{2}}{48}$  or  $\frac{1}{48}$  scudo; value of 1 d.  $\frac{1}{5}$  scudo; value of 1 fr. $\frac{50}{48}$  scudo; value of 50 d. or  $\frac{5.25}{5}$  or 1.05 scudo; value of [1 rix dollar. [5.25 fr. or 1 rix dollar.

7500	7500
50	1.05
48(375000(7812½ scudi by way	375
336 [of London.	75
390	7875.00 scudi by way
384	[of Havre.
60	7875
48	7812½
120	
96	
2½ or ½	

Ans., he will save 62½ scudi by remit-  
[ting by way of London.

(5)

By analysis.

5000	
.01	
5000	5000
50.00	50
\$4950 in Philadelphia will pay \$5000	
.02	4950 [in Baltimore.
99.00	99
\$4851 in Boston will pay \$4950 in	
5000 Philadelphia, or \$5000 in	
4851 Baltimore or Charleston.	
Ans. \$149	

## WEIGHTS AND MEASURES.

## Lesson 225.

(1)

$$\begin{array}{r}
 7000 \\
 .06 \\
 \hline
 1.08 \quad 7000 \quad 420.00 \\
 \hline
 7560.00 \quad 7560) 60480 \quad \$ \\
 \hline
 60480
 \end{array}$$

.08 Ans.

(2)

$$\begin{array}{r}
 1076.4414 \\
 10000 \quad 40 \quad 4 \\
 \hline
 272.25) 1076.4414 \quad 0.0000 \quad (39538 \quad (988 \quad (247 \text{ A.} \\
 81675 \quad 360 \quad 8 \\
 \hline
 259691 \quad 353 \quad 18 \\
 245025 \quad 320 \quad 16 \\
 \hline
 146664 \quad 338 \quad 28 \\
 136125 \quad 320 \quad 28 \\
 \hline
 105390 \quad 18 \text{ sq. rods.} \\
 81675 \\
 \hline
 237150 \\
 217800 \\
 \hline
 19350 \text{ sq. ft.}
 \end{array}$$

(3)

$$\begin{array}{r}
 1 \text{ real.} \\
 \text{or } \$1.2\frac{1}{2} \\
 \text{or } \$1.25 \\
 1.39\frac{5}{9} \text{ fanega.} \quad 10 \\
 \hline
 \$1.250 \text{ a fanega.} \\
 1.25 \\
 650 \\
 \hline
 625 \\
 750 \\
 \hline
 812.500 \\
 \text{(Carried over.)}
 \end{array}$$

(Brought over.)

$$\begin{array}{r}
 \phantom{1.599} 650 \\
 1.599) 812.500 \left( \overline{508.13} \right. \text{\$} \\
 \phantom{1.599} 7995 \phantom{00} \phantom{00} 4550 \\
 \hline
 \phantom{1.599} 13000 \phantom{00} 5313 \\
 \phantom{1.599} 12792 \phantom{00} 5200 \\
 \hline
 \phantom{1.599} 2080 \phantom{00} 1130 \\
 \phantom{1.599} 1599 \phantom{00} 650 \\
 \hline
 \phantom{1.599} 4810 \phantom{00} 4800 \\
 \phantom{1.599} 4797 \phantom{00} 4550 \\
 \hline
 \phantom{1.599} 13 \phantom{00} 2500 \\
 \phantom{1.599} \phantom{00} 2600
 \end{array}$$

(4)

$$\begin{array}{r}
 4.37 \\
 \phantom{4.37} 500 \\
 \hline
 2185.00 \quad 2185) 1311.0 \left( \text{\$} \right. \\
 \phantom{2185.00} \phantom{00} 13110 \phantom{00} (.60 \text{ Ans.}
 \end{array}$$

(5)

$$\begin{array}{r}
 \phantom{12} 22.578 \text{ in.} \\
 \phantom{12} 575 \\
 \hline
 \phantom{12} 112890 \\
 12 \phantom{00} 158046 \\
 3 \phantom{00} 112890 \\
 \hline
 36 \quad 36) 12982.350 \text{ (360.62 about, Ans.} \\
 \phantom{36} \phantom{00} 108 \\
 \hline
 \phantom{36} \phantom{00} 218 \\
 \phantom{36} \phantom{00} 216 \\
 \hline
 \phantom{36} \phantom{00} 223 \\
 \phantom{36} \phantom{00} 216 \\
 \hline
 \phantom{36} \phantom{00} 75 \\
 \phantom{36} \phantom{00} 72 \\
 \hline
 \phantom{36} \phantom{00} 3
 \end{array}$$

(6)

$$\begin{array}{r}
 105 \\
 12 \\
 \hline
 210 \\
 105 \\
 \hline
 1260 \text{ wine gals.} \\
 231 \\
 \hline
 126 \\
 378 \\
 252 \\
 \hline
 277.274) 291060.000 ( 1049.72 \\
 277274 \quad .90 \quad \text{\$} .900 \\
 \hline
 1378600 \quad 944.7480 \\
 1109096 \quad \text{\$} 944.75 \text{ Ans.} \\
 \hline
 2695040 \\
 2495466 \\
 \hline
 1995740 \\
 1940918 \\
 \hline
 548220 \\
 554548
 \end{array}$$

(7)

$$\begin{array}{r}
 34.24 \\
 4 \\
 \hline
 136.96 \\
 25 \\
 \hline
 68480 \\
 27392 \\
 \hline
 3,424.00 \text{ Ans.}
 \end{array}$$

(8)

$$\begin{array}{r}
 1.08 \\
 9000 \\
 \hline
 \text{Ans. } 9,720.00
 \end{array}$$

(9)

$$\begin{array}{r}
 1.5594 \\
 5000 \\
 \hline
 \text{Ans. } 7,797.0000
 \end{array}$$

(10)

$$\begin{array}{r}
 840 \\
 .45 \\
 \hline
 420 \\
 168 \\
 100 \\
 \hline
 16800 \quad 16800) 378.00 ( .0225 \text{ Ans.} \\
 336 \quad \$ \\
 \hline
 33600 \\
 42000 \\
 33600 \\
 \hline
 84000 \\
 84000
 \end{array}$$

THE END.





